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ORIGINAL ARTICLES

AN OUTBREAK OF "PEMPHIGUS NEONATORUM" IN A MATERNITY HOME

By S. D. Elliott, M.B. Lond., D.P.H.
BACTERIOLOGIST AT THE EMERGENCY PUBLIC HEALTH LABORATORY, HAILEYBURY COLLEGE, HERTS

E. Harper Gillespie, M.B. Edin.
BACTERIOLOGIST IN THE DEPARTMENT OF BACTERIOLOGY AND PREVENTIVE MEDICINE, UNIVERSITY OF MANCHESTER; AND

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OBSTETRIC AND GYNÆCOLOGICAL SURGEON TO THE LONDON HOSPITAL; COUNTY OBSTETRIC CONSULTANT FOR HERTS

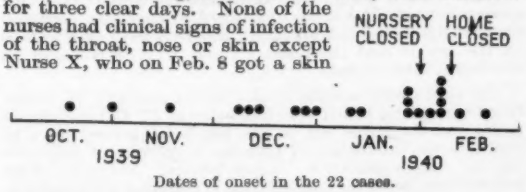
This outbreak of mild staphylococcal skin infection, which affected 22 infants, 2 mothers and a nurse, occurred between October, 1939, and February, 1940, at a maternity home. We use the word "pemphigus" because it is in common usage to describe this type of skin infection in the newly born. The term "bullous impetigo," often used alternatively, does not properly describe the condition, because in this epidemic, which appeared to conform fairly closely with the mild type of pemphigus described in the Ministry of Health's memorandum (1925), bullæ did not appear. We agree with Carter and Osborn (1938), who described an epidemic in many respects similar to ours, when they propose the term "contagious subepithelial dermatitis."

HISTORY OF THE OUTBREAK

The home, formerly a private residence, has beds for 38 women. It is fully equipped, adequately staffed with midwives and nurses, has an isolation-room, and the beds are properly spaced. The nursery, with accommodation for 20 infants, is 24 by 18 ft. and 11 ft. high, with a window 8 ft. square on one side facing the door. A day and a night nurse were on full-time and two other day nurses on part-time duty in the nursery. The night nurse (Nurse X) was on duty in the nursery from the date it opened (September, 1939) until Feb. 8, 1940, when she was suspended from duty because of an infective skin lesion. On Jan. 30 the nursery began to be used for infected infants only, the healthy infants, including the 4 born after that date, being isolated in another room. Nurse X was thus the only nurse who was continuously (except for days off duty after the occurrence of each case of infection) in charge of all the infants born in the home except the last 4, coming into close contact with them during bathing, changing napkins, feeding and so on. Of the last 4 infants born, only 1 became infected, and it is of interest that this infant was looked after by the nurse who shared a bedroom with Nurse X. These points are emphasised in view of the bacteriological findings and the sites of the primary skin lesions.

The first baby to show signs of infection was born on Oct. 16, 1939. The mother had 3 other children who, just before the confinement, had been admitted to a local hospital with profuse impetigo. It was found out later that the father had been in the habit of visiting them in hospital and then going on immediately to the maternity home to see his wife and baby. This infant when six days old developed an infective eruption from which a pure culture of *Staphylococcus aureus* was obtained; these organisms were not examined in further detail. Both the mother and infant were removed to a hospital whence four days later they were discharged, the rash having dried up and almost gone. The dates of the first appearance of the infection in the 22 cases is shown in the figure and table I. The last of the babies to become infected was born on Feb. 11. The mother was admitted although the home had been closed to new admissions since Feb. 2, because on her arrival the baby was on the point of being born. On Feb. 14 the home was temporarily closed for fumigation. No fresh cases have occurred since it was reopened on March 11.

The infected babies were removed, directly they showed signs of the disease, to a separate ward in which they were nursed by a separate nursing staff. After Jan. 30, as already stated, this arrangement was reversed, the nursery being reserved for infected babies only. Isolation was not always complete, however, since all those affected were breast-fed and the mothers of infected and uninfected babies sometimes occupied the same ward. Moreover, the separate nursing staff lived in the same quarters as the ordinary nursing staff and fed at the same table. Whenever a case occurred the day and night nurses who had been in contact were at once taken off duty, followed the usual routine of disinfection of person and clothing, and were sent away from the home for three clear days. None of the nurses had clinical signs of infection of the throat, nose or skin except Nurse X, who on Feb. 8 got a skin lesion on the back of her hand and was forthwith suspended from all duty. A similar lesion had appeared a week before on her elbow; this, unfortunately, she failed to report, and it remained unnoticed. From the hand lesion staphylococci were isolated which corresponded serologically with those recovered from the eruptions in the infants. In February two mothers whose babies were affected developed a similar eruption on the skin of the breast; both infants were breast-fed. In both cases the infection appeared in the month *after* the baby had contracted the disease.



Dates of onset in the 22 cases.

Face-masks and gowns were always worn by nurses on duty in the nursery but rubber gloves were not used until mid-way through the outbreak, after which they were always worn when handling the infants. This measure did not have any observable effect on the spread of infection.

TABLE I—INCIDENCE OF PEMPHIGUS AT THE HOME

Month	Babies developing pemphigus	Babies born at the home
September	0	34
October	2	32
November	1	17
December	6	19
January	6	11
February	7	4

SKIN LESIONS

Some exposed area of skin—the face, scalp, neck, hand, buttocks and thighs (exposed during changing napkins)—was almost always the first to be affected. After the occurrence of the first case a careful look out was kept for the first sign of a rash, so that the primary sites were noted and recorded. In 7 it was on the face, in 1 the scalp, in 2 the neck, in 7 the hand, and in 1 each the buttock, thigh, elbow and shoulder. In the face it was often on the margin of the eyelid or the outer canthus; on the hand it was usually at the base of a finger-nail. A small clear-cut red area, a small red spot, or a small crop of confluent spots first appeared. The time of appearance varied from the second (1 case) to the twelfth day (2 cases) after birth, more than half being from the fourth to the sixth day inclusive. In a few hours the cuticle over the affected area became yellowish, wrinkled and loose. The quantity of fluid secreted amounted to no more than a film sufficient to separate and slightly raise the cuticle; only once during the whole outbreak was a small blister, of very short duration, seen. The cuticle quickly broke, exposing the superficial layers of the cutis. The exposed areas were at first bright red and moist, but quickly dried and faded and healed rapidly. The primary lesions were almost invariably followed by similar but more extensive lesions, and in this way large areas of skin, especially over the trunks and buttocks, were

denuded of epidermis. None of the infants appeared ill or had pyrexia or other signs of infection; all continued to thrive and gain weight, and none (except 2 premature infants) remained in the home more than fourteen days. The breast eruptions of the 2 mothers were confined to the superficial layers of the skin and did not lead to abscess formation. Indeed, no breast abscess or other type of septic infection occurred in the home throughout the epidemic, and the incidence of puerperal pyrexia did not rise. In the infected nurse the skin lesion on the hand appeared to be rather more deeply seated but when seen there was no pus.

BACTERIOLOGICAL INVESTIGATION

Exact bacteriological details are available only for the cases occurring during February, at the end of the outbreak. Swabs from the skin lesions were taken for examination. The cases examined in this way included the last 8 infected infants, the 2 mothers with skin lesions on the breast and the nurse (Nurse X) with a lesion on the back of the hand.

The swabs were inoculated on nutrient agar and 5% horse-blood-agar plates which were incubated at 37° C. for eighteen hours and thereafter left on the bench for several days to facilitate the production of pigment in colonies of staphylococcus. Representative staphylococcal colonies were selected and tested for fermentation of mannitol and coagulase production. All "coagulase-positive" strains were identified serologically by one of us (E. H. G.) by the slide agglutination method (Cowan 1939), dividing the strains into the three main types I, II and III, and into additional subtypes according to the reactions with absorbed sera (Gillespie and others 1939). The sera were supplied by Dr. S. T. Cowan of the department of bacteriology and preventive medicine, Manchester University.

From all cases except one almost pure cultures of *Staphylococcus pyogenes* were obtained.* These produced golden pigment on agar, fermented mannitol slowly (3–5 days) and coagulated human plasma. They also produced a narrow zone of hæmolysis on horse-blood agar but the strains were not tested for soluble hæmolysin. Serologically they all belonged to type IIIc (Cowan) (table II). In the one exception which gave a few colonies of *Staph. saprophyticus albus* the lesion had been painted with an antiseptic immediately before the swab was taken.

TABLE II—STAPHYLOCOCCI ISOLATED FROM SKIN LESION IN 11 CASES

Source of staphylococci	Cases examined	Cases yielding *Staph. pyogenes*	Serological type (Cowan)
Infants' skin ..	8	7	IIIc
Mothers' breast ..	2	2	IIIc
Nurse's hand ..	1	1	IIIc

NASAL CARRIERS

McFarlan (1938) and Gillespie and others (1939) have shown that *Staph. pyogenes* is present in the nose of over 40% of the population. It was possible that amongst the nurses there was a carrier of the causal strain of staphylococci. Throat and nose swabs were therefore taken from the entire nursing staff, but in no instance was a profuse culture of staphylococci obtained from the throat.* *Staph. pyogenes* was obtained from 9 nurses, the incidence of serological types being: type I, 4 times; type IIIc, once; type IIId, 3 times; and an unknown type once. One colony only was identified from each culture.

The nurse found to be harbouring *Staph. pyogenes* type IIIc in the nose was Nurse X. She had, at the same time, a staphylococcal lesion on the hand and a week before had had a similar lesion on the elbow. Type IIIc staphylococci were recovered from her hand but the elbow was not investigated.

AIR INFECTION

Blood-agar plates were exposed to the air in the home during the outbreak on one occasion from 6 A.M. until 12 noon, two plates being exposed in each room tested. They were subsequently incubated overnight at 37° C. after which 2 representative staphylococcal colonies resembling those previously isolated from the skin-lesion cultures were selected from each plate and tested for coagulase production; coagulase-positive strains were then identified serologically.

Staph. pyogenes type IIIc was recovered from the plates exposed to the air in the nurses' dining-room, a nursery containing 2 infants with skin lesions and a ward accommodating 2 mothers both with breast eruptions and 1 with the same staphylococcus in the nose. We were unable to recover this type of staphylococcus from plates exposed in 2 unoccupied wards or in a ward containing an uninfected mother. Swabs from door handles, bed linen and furniture in wards containing infected patients also failed to reveal the presence of these staphylococci; only 1 colony was tested from each culture taken from these situations.

DISCUSSION

Although a full bacteriological investigation was only made in the later stages, it is likely that the whole outbreak was due to *Staph. pyogenes* type IIIc (Cowan). Skin carriers of *Staph. pyogenes* are fairly common, comprising 19·5% of a group of 159 students examined by Gillespie and others (1939); of these carriers about one in ten were carriers of type IIIc. The isolation in profuse culture of this serological type from 10 out of 11 cases is thus very unlikely to have been due to chance. It will be recalled that in the single exception the lesions had been painted with an antiseptic immediately before the swab was taken.

It is impossible to determine conclusively the source or the means of spread of the infection. There were at least two possible sources of primary infection. The first was the 3 cases of impetigo occurring outside the hospital, the infection being introduced by the father or the mother. This point was not investigated. The second possible source was the nurse from whose nose and hand lesion *Staph. pyogenes* type IIIc was isolated. Gillespie and others (1939) have shown that staphylococcal nasal carriers tend to persist and that skin carriage is closely related with nasal carriage. Provided the nurse was a chronic carrier before the outbreak, her close contact with the infants would have given ample opportunity for infecting them. Alternatively she may herself have been infected by an infant during the early stages of the outbreak. There are three possible means of spread—by contact with the carrier nurse, through contaminated garments, gowns, gloves, hands and so on, and by the air. The last two involve the possibility of case-to-case transfer. The presence of the causative organisms in the air of the wards in which the cases occurred and in the nurses' dining-room indicates the prevalence of that particular strain of staphylococcus in these situations during the outbreak and suggests that aerial transmission may have been a factor in the spread of the disease. On the clinical side the outstanding feature of the outbreak was the mildness, even triviality of most of the cases; in 10 there was only one spot (in half of them on a finger) which was well in three days. It is easy to overlook such a trivial case and to fail to realise that a suspicious spot may be the prelude to an epidemic and the danger signal that a source of infection exists.

Although inconclusive, the available evidence suggests that contact infection by Nurse X was an important factor in maintaining this outbreak and may even have been the original source of infection.

SUMMARY

An outbreak of skin infection resembling pemphigus neonatorum occurred in a maternity home; 22 infants, 2 mothers and 1 nurse were affected.

Profuse, almost pure cultures of *Staph. pyogenes* were obtained from the lesions in 10 out of 11 cases examined bacteriologically and all were found to be type IIIc (Cowan).

A nurse who had two skin lesions was a nasal carrier of staphylococci of the same type. Staphylococci of this type were also recovered from plates exposed to the air during the outbreak in two wards in which were infected patients and in the nurses' dining-room. These organisms

* Hæmolytic streptococci were never isolated from the throats or noses of the nursing staff or from the skin lesions of the infants, mothers or nurse X.

were not isolated from the air of two unoccupied wards or a ward containing an uninfected patient.

The evidence suggests that the nurse may have been the source and also the means of spread of the infection.

Our thanks are due to Dr. S. T. Cowan for the use of his staphylococcal type sera for this investigation.

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OPIUM AS A PREANÆSTHETIC SEDATIVE IN CHILDREN

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PREANÆSTHETIC sedation in children has always presented a problem to the anæsthetist. Nobody likes seeing a terrified child arriving crying at the operating-theatre, as so often happens when no premedication, or only an injection of atropine, has been given. Conversely the administration of an anæsthetic to a child deeply under the influence of some hypnotic is not without danger.

The barbiturates, especially Nembutal, have been used widely as a preanæsthetic sedative for children but in our experience the action of this group of drugs is unreliable. After an adequate dose a child may be either asleep or restless before operation, and postoperatively either recover quietly or be difficult to control for a time; one noisy patient is enough to upset an entire children's ward. Another difficulty is the impossibility of persuading some children to swallow capsules even when disguised in jam or sweets. Rectal paraldehyde and Avertin cannot always be given in a busy children's ward and are certainly not the preanæsthetic of choice in every case.

Opium derivatives are seldom administered to children, possibly because of a traditional prejudice against them, but investigation has shown (B. C. Leech 1935, C. H. Robson 1936) that these drugs are extremely well tolerated. The requisite dose consistent with safety depends on the patient's basal metabolic rate, and the relatively high rate found between the ages of 1 and 20 years when compared with that of adult life has been amply shown in the work of Du Bois and Benedict (1924). The rates of infants aged 1–3 months and 1 year are respectively the same as those of adults aged 80 and 20 years. Between 1 and 20 the rate rises sharply to a maximum at 6 years, declines up to 12 years, and reaches almost the same high level again at puberty before the gradual decline towards old age. We found that whereas an adult weighing 133 lb. (average) took morphia gr. $\frac{1}{4}$ or Omnopon gr. $\frac{1}{2}$ satisfactorily, a child of 1 year (average weight 20 lb.) tolerated morphia gr. 1/40 or omnopon gr. 1/21 equally well. The table given here is based on that in Leech's article (1935), the dose of morphia in each case being the nearest convenient fraction of gr. $\frac{1}{4}$ or gr. $\frac{1}{2}$ to the appropriate calculated dose. The omnopon dosage was based on the fact that gr. $\frac{1}{2}$ of this drug contains morphia gr. $\frac{1}{4}$, plus the other active principles of opium, and was therefore usually just under double that of morphia.

To inhibit mucous secretions, hyoscine was given in properly balanced doses with the opium derivatives. The drug is a metabolic stimulant, but this action is counterbalanced by its power to reduce emotional excitement; thus the sedative action of the opium is left unimpaired and can be exercised to the full. Furthermore, having no vago-inhibitory action, hyoscine does not produce tachycardia, as atropine does occasionally when used alone. Many anæsthetists now avoid atropine as being too stimulating to be a good preanæsthetic.

RESULTS

The table shown here was used with satisfactory results in a series of 600 children aged from 1 month to 16 years. There were a few failures at the beginning from over-caution and under-dosage. Most of the children arrived in the theatre in a drowsy and unapprehensive state, taking a detached view of the proceedings; a small proportion was asleep and not easily disturbed. Inductions were smooth, amount of anæsthetic used reduced, and postoperative consciousness quickly regained with a minimum of restlessness; this last point is valuable after tonsillectomy. In some minor procedures, such as the changing of dressing and plaster, these drugs were sufficient unsupplemented by anæsthesia. Postoperatively, the retrograde amnesic effect of hyoscine has been present in most of our cases, a fact testified to by the ward nurses who get this information easily in the course of daily routine. The anæsthetist is usually confronted with a barrier of shyness when he makes a personal quest for information.

The table doses were slightly exceeded without incurring dangerous symptoms in children who were obviously excitable and had an increased B.M.R., and in those who were overweight for their age-group (excluding the over-adipose who often tend to be under-developed in all other respects and may require reduced dosage). No instance of abnormal B.M.R. due to endocrine disturbance was encountered in this series.

DOSAGE OF MORPHIA OR OMNOPON WITH HYOSCINE ACCORDING TO AGE

Age (years)	Average weight	Either morphia (gr.)	Either omnopon (gr.)	With hyoscine (gr.)
Up to 6/12	Variable	Not tried	1/30 (not tried under 3 months)	1/1200–1/900
6/12–1	18½ lb.	Not tried	1/30–1/24	1/900
1–2	22 lb.	1/40	1/24–1/21	1/600
2–4	2 st. 2½ lb.	1/32	1/18–1/15	1/600
4–8	3 st.	1/20	1/12–1/9	1/450
8–12	4 st. 5½ lb.	1/16	1/9	1/450
12–16	6 st. 6 lb.	1/12	1/6	1/300

A few emergency cases with pain and fever benefited less than other children from the doses given, presumably because their B.M.R. was raised, but for reasons of caution no attempt has so far been made to increase the dosage. Patients of advanced development in the 12–16 year group often took satisfactorily the full adult dose of omnopon gr. $\frac{1}{2}$ or morphia gr. $\frac{1}{4}$ with hyoscine gr. 1/150.

It is, of course, important that the fractional doses of drugs should be accurately worked out. To avoid confusion and mistakes we employ the method, practised at this hospital for many years, of double check for every injection given.

SUMMARY

Opium derivatives are well tolerated by children.

Dosage depends on the basal metabolic rate, which increases to a maximum at the age of 6, declines up to 12, rises again during puberty and then declines throughout life.

The appropriate dosage of morphia, omnopon and hyoscine were calculated for children of all ages under 16.

Morphia and hyoscine or omnopon and hyoscine administered in the calculated doses were satisfactory as preanæsthetic sedatives in 600 children between the ages of 1 month and 16 years.

Our thanks are due to Dr. I. W. Magill for suggesting this work and for his help and criticism, and to Dr. J. B. Cook, medical superintendent of the West Middlesex County Hospital, for permission to publish this paper. We also wish to thank the nursing staff for their coöperation.

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INJURY TO THE CENTRAL NERVOUS SYSTEM BY BLAST

OBSERVATIONS ON A PHEASANT

BY

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BLAST effects from high explosives, which produced no marks of external violence but nevertheless caused instantaneous death, were described in the last war. Examples are also cited in which death was not immediate, and in some of these evidence of injury to the central nervous system was apparent during the hours or days preceding death. That definite pathological changes in the central nervous system can be caused by blast was shown by Mott (1916 and 1917) when he recorded the macroscopic and microscopic abnormalities in brains and spinal cords of soldier casualties. His findings were widely and uncritically accepted as the explanation for the variable and bizarre symptom-complex popularly referred to as "shell shock."

Again in this war there have been reports of the damaging effects of blast on vertebrates. The human material studied has been largely from fatal cases. Damage to the lungs characterised by alveolar ruptures and hæmorrhages has been the consistent and dominant feature. Hadfield, Ross, Swain and Drury-White (1940) cited 10 cases of sudden death in persons subject to the blast effect of high-explosive bombs. In none of these was there any evidence of external trauma; there were gross hæmorrhagic lesions in both lungs in all, and blood-stained secretions in the upper air-passages in some. Microscopic examination of other tissues was not mentioned in this preliminary report, but its authors felt that the lung damage, even though severe in some cases, was not sufficient to cause sudden death. They looked on this finding rather as an unmistakable indication that the patient had suffered considerable blast effect. "It seems more likely," they conclude, "that blast produces death by interfering with some vital tissue or centre in which, from the extreme rapidity of action, structural changes are unlikely to be found." Falla (1940) reported a case with capillary hæmorrhages in both lungs due to blast and Zuckerman (1940) has published his experimental findings in animals subjected to blast. He found extensive hæmorrhages in the lungs in all fatal cases and less severe lesions in animals surviving the immediate blast effect. The severity of the pulmonary lesions was roughly dependent on the nearness of the animal to the explosive discharge. No detailed mention is made in this report of examination of other tissues. Zuckerman concludes from these experiments that it is the pressure component of the blast which bruises the lungs by its impact on the body wall.

We have seen a small series of patients who have been exposed to blast and have exhibited a variety of neurological abnormalities. Some, without showing focal signs, have simply been apathetic and indifferent, others have been depressed, and one, seen some days after the injury, had xanthochromic spinal fluid although there was no mark of external violence to the head or spine. In another there were signs of spinal-cord damage limited to the anterior horn cells. We have theorised that the symptoms might be due to the hydraulic-like pressure on the central nervous system in its firm encasement, resulting from the sudden compression of the thoracic cage with its consequent violent back-pressure on the venous side.

The neurosurgeon is all too familiar with the sudden and alarming herniation of the brain that can take place through a widely opened dura when a patient under local anæsthesia coughs unexpectedly, and he is also familiar with the changes produced in the circulation in the meningeal racchidian veins of the vertebral extradural space and in the circulation of the spinal cord itself in such a situation. The sudden compression of the thorax forces blood out through the various venous channels, valveless or incompetently valved, that drain the cranial cavity and the spinal canal. This results in a sudden and striking increase in intracranial and intraspinal pressure. This pressure in the closed intracranial and intraspinal cavities would presumably be incomparably greater when caused by a blast wave than when produced by coughing, in that the compression of the body surface generally would prevent the escape of blood into the extremities and abdomen, and intracerebral hæmorrhages may certainly result from paroxysmal coughing in children with whooping-cough.

THE BLASTED PHEASANT

We have collected a bit of evidence from the study of a pheasant which was suffering from blast effect, which lends some support to the speculations advanced with regard to the mechanism of injury. The bird was found ninety feet from the edge of a bomb crater twelve hours after two large bombs had been dropped in a wooded patch the previous night. There was no way of determining how near to the explosion the bird had been. It was standing on both legs with the eyes closed most of the time (fig. 1). It did not move when approached and there was no reaction of fear or resistance when it was picked up. When placed on its feet and pushed along it would take a few unsteady steps with legs tending to cross and then came to a standstill. It could be placed in any position and would remain in that position until moved. Even when placed on its back and in other unusual positions it exhibited a waxy flexibility that closely resembled the catatonic patient (fig. 2). Our zest for a thorough anatomical scrutiny of the bird was surpassed only by the gastronomical designs of the gamekeeper who happened upon it at about the same time. A compromise was effected and an hour after it was found (13 hours after the bombing) the bird was killed by cutting the large vessels in the neck and allowing it to bleed freely. The brain was carefully removed with the dura intact. The feathers were plucked and a thorough search revealed no external evidence of trauma. All organs were removed and together with the brain placed in 10% formalin.

Gross findings.—Discoloration of the undersurface of the forebrain beneath the dura was the only gross finding in the uncut brain. Both lungs showed much hæmorrhagic congestion—the left one appearing solid and beefy red, resembling the stage of red hepatisation in lobar pneumonia. There were no hæmorrhages along the ribs nor were there any fractured ribs. No gross lesions were observed in the other organs. On sectioning the brain there were gross hæmorrhages in the forebrain extending backwards as far as the ventricle (fig. 3). No hæmorrhage could be seen macroscopically in the midbrain or cerebellum. Cut sections of both lungs showed extensive hæmorrhagic consolidation (fig. 4). The heart, liver and spleen showed nothing abnormal macroscopically. The sections were embedded in celloidin and cut. Hæmatoxylin-Van Gieson stains were done on all tissues and some sections of the brain were also stained with toluidin blue.

FIG. 1—Position of pheasant when found. Note dejected appearance and closed eyes.

Microscopic findings.—*Brain.* Throughout the cerebrum the capillaries

FIG. 2—One of several attitudes maintained indefinitely after posturing.

were congested and in the forebrain on both sides there were numerous hæmorrhages of varying sizes. These seemed to be chiefly associated with the small veins and to a lesser extent the capillaries. Many of these formed a collar about the vessels with the blood-cells extending outwards and separating the neuroglial framework about them. No consistent change could be seen in the nerve-cells with the stains employed. We were struck by the presence of numerous hæmorrhages surrounding the ventricle in the hypothalamic region. In two areas, clusters of blood-cells were clinging to the inner surface of the ventricle. In the cerebellum four small hæmorrhages were found in one section. *Lungs.* Massive hæmorrhages were found in both lungs. In many areas the small bronchioles and bronchi were occluded with blood and mucus. Many alveoli were ruptured in addition to containing red blood-cells. *Heart.* Deep in the muscular layer of one ventricle there were numerous small hæmorrhages. These were associated with very small vessels. Otherwise the vessels and musculature appeared normal.

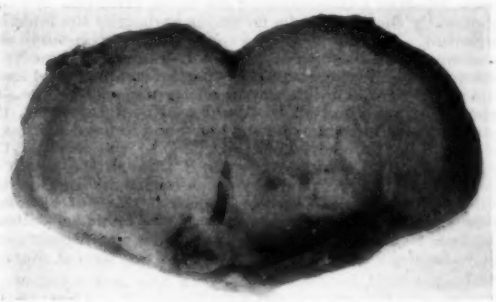

FIG. 3—Section through forebrain showing hæmorrhagic area.

DISCUSSION

This report is presented to call attention again to the fact that lesions of the central nervous system can be produced by blast. Though pulmonary damage is apparently a constant finding and at times is very extensive it seems unlikely that it is responsible for either sudden death or later fatalities except in a contributory way. It seems likely that under certain conditions the hydraulic-like force acting on the central nervous system may, when of the right degree, cause cessation of nerve-cell activity without producing macroscopic or microscopic evidence of injury—in other words, it may produce the clinical picture of concussion.

In the two cases reported by Mott (1917) both of the soldiers were exposed to the blast of high-explosive shells. Neither showed external signs of injury. The first man was admitted to hospital in a state of acute mania and died suddenly 24 hours later. The only gross pathological finding outside the brain was a large hæmorrhagic area in the lower lobe of the left lung. Both lungs were œdematous. Summarising the histological changes in the brain Mott reported "... vessels of the pia-arachnoid membranes of the brain are congested, and there are scattered sub-pial hæmorrhages of microscopic size almost everywhere. In the white matter of the corpus callosum, the internal capsule, the pons, and medulla there are seen congested veins and hæmorrhages into the sheaths of these vessels with occasionally extravasation of blood corpuscles into the adjacent tissue." The second patient became comatose immediately after an explosion and died the same day without regaining consciousness. In this case only the examination of the brain is reported. Here again the striking finding was the presence of hæmorrhages of varying degree into the substance of the brain.

A third case is described in the same article by Mott. A soldier was brought in from no man's land with a superficial graze over the spine of the left scapula and a small "in-and-out" wound of the right gluteal region. He was mentally clear but drowsy with "halting speech." There was complete paralysis of the legs and abdominal muscles and the left side of the face. Power in both arms was diminished. The level of complete anæsthesia was at the umbilicus. Rectal and vesicle sphincter control were lost. This patient gradually became comatose and died seven days later. A complete post-mortem examination was made and nothing to account for death was found. Sections of the spinal cord from D.8 to L.2 inclusive were examined microscopically, and the appearances, though varying in intensity, were similar in all of them. On the surface there was evidence of subarachnoid bleeding. The surface veins were congested though the arteries and capillaries were relatively empty. "In places," Mott wrote, "the veins could be seen ruptured and in some sections intraradicular hæmorrhage was observed. In the substance of the spinal cord itself were numerous minute hæmorrhages, varying in size from a pin-head, and visible to the naked eye, to a pin-point, invisible except by the aid of the microscope. The hæmorrhages are seen especially in situations where the surrounding tissue offers least support; consequently they are found in the grey matter of the anterior horns, but especially at the base of the posterior horn near the central canal."

FIG. 4—Sections of right and left lung showing hæmorrhagic consolidation.

Mairet and Durante (1917, cited by Mott) subjected rabbits to blast by means of melinite explosions. Histological examination showed diffuse hæmorrhages in the lungs, spinal cord and brain; hæmorrhage in the kidney was found in one animal.

Mott thought that the aerial compression generated by high explosives might be transmitted to the fluid about the base of the brain, causing shock to the vital centres and death. He considered, too, that the forces of compression and decompression might both act on the central nervous system producing arterio-capillary anæmia, venous congestion and rupture of small vessels. He did not explain, however, how the forces were brought to act on the circulation.

We have purposely omitted any consideration of the decompression effect or "suction wave" in our discussion, although it is, together with the compression effect, embraced in the term "blast." Lieut.-Colonel Arthur James,[1] after experimenting with low-pressure effects, feels that the negative pressure wave following the positive one may, in the suddenness of the change, be an important factor in cerebral injury. But there is sound experimental evidence that this suction effect is of little significance in the production of the pulmonary lesions (Zuckerman 1940).

From the experimental reports and case-records to date it seems clear that the effect of the blast wave on

1. Personal communication.

man and animals sufficiently near and directly in the path of this violent compression force may be so damaging as to cause instant death. Lesser degrees of injury may also occur, as exemplified by the cases which live for hours or days after exposure and show definite pathological lesions in the post-mortem examination; by cases which have coexisting wounds from the shell or bomb fragments which overshadow the signs of the lesions produced by the blast alone; and finally, by the milder cases which, recovering without showing definite signs, make it impossible to prove the existence of minor lesions or to establish the fact that concussion of the central nervous system was produced.

We are diffident to suggest, from our circumstantial evidence, that blast affecting the central nervous system can produce a symptomatology ranging from slight mental disturbance to signs of damage to the anterior horn cells. Yet we have encountered such varied signs in our small series of patients exposed to blast, and on theoretical grounds can visualise pathological and physiological disturbances as varied as the symptomatology. It is important that all this should not be construed, as it was in the last war, as justifying the term "shell-shock" with all its connotations. The changes we are discussing should be transitory in the less severe disturbances, but if permanent they should be measurable by abnormal neurological signs or electroencephalographic studies (Jasper, Kershman and Elvidge 1940). The problem of differential diagnosis between organic disturbances and purely psychogenic disorders remains.

SUMMARY

A pheasant found after an air-raid suffering from the blast effect of a high-explosive bomb was in a dazed condition resembling catatonia. There were no external injuries but hæmorrhagic lesions were present in the lungs and heart muscle, and in the brain there was capillary congestion throughout the cerebrum with gross hæmorrhages in the forebrain.

We suggest that the mechanism responsible for the cerebral lesions was the hydraulic-like pressure on the central nervous system, in its firm encasement, resulting from sudden compression of the thoracic cage with consequent violent back-pressure on the venous side.

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PARATYPHOID ABSCESS

RECOVERY OF ORGANISM FROM BONE-MARROW

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SIMPLE abscess caused either by *Bacterium typhosum* or *Bact. paratyphosum* B is listed by Browning along with the less common complications such as perichondritis, periostitis and middle-ear involvement. It is not often mentioned as a possible source of an outbreak of enteric infection, and this is apt to be forgotten.

In the first case a breast abscess caused by *Bact. paratyphosum* B developed two months after the patient's discharge from hospital and the infecting organism was found in the sternal bone-marrow at a time when it could not be recovered from any other source. The second patient's symptoms were more severe and therefore more likely to be fully investigated, but both histories underline the need for careful examination of abscesses in patients with a recent enteric infection.

CASE-RECORDS

CASE 1.—A woman of 38 became ill on July 20, 1940, and was diagnosed as suffering from paratyphoid fever on Aug. 3 when she was admitted to the City Hospital, Aberdeen. On this date her stools gave an abundant growth of *Bact. paratyphosum* B and her serological reactions were typical of that infection, but the organism was not found either in her urine or on blood-culture. The patient was never acutely ill and by Aug. 15 her temperature was normal and her fæces free from the infecting organism. Repeated culture both of the urine and fæces between this date and her discharge on Sept. 19 was negative.

During the first examination of the patient in hospital a small painless lump with indefinite edges was found in the right upper quadrant of the left breast. The patient thought it had been present before the onset of her illness, and it was considered to be an area of chronic mastitis. During convalescence, on Aug. 20, she complained of a dull ache in this breast, which however was not inflamed, and the pain disappeared in a week or two. She was advised to have the breast examined at the outpatient department of the Aberdeen Royal Infirmary, and on Sept. 20 she reported that the lump no longer troubled her and was getting smaller, so she was told to return for periodic examination. On Nov. 21 the breast became inflamed and a week later a superficial abscess developed over the site of the original lump. The abscess was incised and yielded a small quantity of thin pus which on film was predominantly polymorphonuclear and contained gram-negative bacilli. On plating out a pure culture of *Bact. paratyphosum* B was grown. The abscess began to heal rapidly after incision, though the original tumour remained, and two days later and on subsequent examinations only *Staphylococcus albus* was found in the discharge. Repeated clinical and two radiographic examinations gave no evidence of involvement of bone or periosteum. On Dec. 3, after three negative examinations of swabs from the breast wound, sternal puncture was performed. By inoculating 0·5 c.cm. of marrow fluid into 20 c.cm. of MacConkey broth and meat-infusion broth *Bact. paratyphosum* B was obtained.

CASE 2.—A woman of 43 was admitted to the City Hospital, Aberdeen, on Sept. 12, 1940, suffering from paratyphoid fever. Her illness was of moderate severity but she persisted in excreting *Bact. paratyphosum* B in her fæces for some weeks after admission to hospital. She was discharged on Dec. 12, when repeated examination of her fæces, urine and bile had apparently shown that she no longer harboured the infecting organism. During convalescence sternal puncture was performed but *Bact. paratyphosum* B was not obtained. A few days after leaving hospital the patient complained of lower abdominal pain and difficulty in micturition and on Dec. 30, when she was admitted to Aberdeen Royal Infirmary, the pain had become severe and she was found to have an abscess arising from the pelvis and reaching to the level of the umbilicus. The abscess was opened through the pouch of Douglas and a large quantity of pus removed. In films the cells were almost all polymorphonuclear and no organisms were seen, but *Bact. paratyphosum* B was found on culture. On Jan. 7 culture of the blood and fæces was negative but *Bact. paratyphosum* B was grown from the sternal marrow fluid.

COMMENT

Abscesses caused by the organisms of typhoid and paratyphoid fevers are uncommon but important because unlike many other complications they may produce little systemic effect and because they exactly simulate an ordinary pyogenic abscess. The first patient was nursed at home after the breast was opened, and had the surgeon not insisted on bacteriological examination the possibilities of spreading her infection would have been great. As to the time and manner of the invasion of the breast tissue and as to whether the presence of *Bact. paratyphosum* B in the bone-marrow played any part in it there can be only speculation, but the finding of the organism in the sternal marrow after it had disappeared from all other sources is of interest from the carrier point of view. In the second patient sternal-marrow culture was negative when the other investigations were also negative, and it may be significant that both positive marrow cultures were found fairly soon after surgical interference. These are unfortunately isolated and may be fortuitous findings, but there is experimental evidence that the enteric organisms may persist in the marrow for long periods. Browning (1933) quotes the recovery of *Bact. typhosum* from the marrow of a rabbit 162 days after intravenous inoculation when the liver, gall-bladder and bile were free, and Coplans (1936) in a series of 104 rabbits recovered the same organism in 90% of instances up to the 27th week. Ling and his colleagues

(1940) lately described the value of sternal-marrow culture as compared with blood-culture in typhoid fever; in one patient they found that the bone-marrow still harboured the organism on the 67th day of illness, and in another patient that medulloculture was positive two weeks after convalescence was well established (see *Lancet*, 1940, 2, 169). It has also been said that the bone-marrow forms a depot for the organism in the true relapse which sometimes follows enteric infections. Browning's study of the treatment of carriers shows that, though surgical treatment is satisfactory, in about a quarter of the cases cure may not result. If the gall-bladder is to be considered a test-tube for the growth of the enteric organisms in the carrier may it not be that, in some instances at least, the reticulo-endothelial cells of the bone-marrow continue to act as the platinum loop? Further investigation of the bone-marrow in the unexplained carrier may be worth while.

I wish to thank Prof. John Cruickshank for help; and Dr. John Smith, regional bacteriologist, and Mr. G. Gordon Bruce, surgeon to Aberdeen Royal Infirmary, for access to their records.

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A TELLURITE BLOOD-AGAR MEDIUM FOR THE RAPID DIAGNOSIS OF DIPHTHERIA

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Since the discovery by Anderson and others (1931) of the diphtheria types a wide variety of tellurite media have been introduced for diagnosis and type differentiation and some apology may be necessary for the description of yet another such medium. However, the multiplicity of the media in common use is in itself an indication that a really satisfactory medium has yet to be found. Growth is slow on most of these media, none of which consistently fulfils the requirements of the clinician in regard to speed of diagnosis. The medium described here is advanced as a solution to this problem.

Cooper and his co-workers at Leeds (1940) have recently made a comparative study of most of the media in common use, and have recommended Neill's medium (Neill 1937) as the most satisfactory, since it was easy to prepare and give the highest percentage of positives of all the media tried. The relative value of the various media in regard to speed of diagnosis was not referred to in the paper, but I understand that little difference in speed was found. Neill's medium was introduced for diphtheria diagnosis in Cardiff but its performance was poor—the type of mitis strain prevalent in the Cardiff area either failed completely to grow on the medium or was much inhibited. In addition, some of the intermediate strains gave rather slow growth. The type of diphtheria prevalent in Cardiff differs from that in Leeds in that gravis strains are rare. An analysis of some 200 positives gave the following incidence of the three types: intermediate, 59·2%; mitis, 39·2%; gravis, 1·6%.

Attempts were made to overcome the inhibitory effect of Neill's medium on mitis strains, and it was found that if the medium was made up as an unheated, instead of a heated, blood agar the effect disappeared. The Leeds workers had found that if McLeod's medium was made up as an unheated blood agar the proportion of mitis positives was increased by 6%, but they rejected the unheated blood medium because the type-differentiation was less pronounced. Glass (1939) first described the inhibitory effect of heated blood on mitis strains and recommended the use of unheated blood.

As a result of much experiment the following medium has been adopted for routine diphtheria diagnosis in Cardiff. It bears little relation to the Neill's medium from which it was derived except that the agar basis is the same.

R Lab. Lemco	.. ..	10 g.
Difco proteose peptone or Bacteriological Peptone (Evans Sons Lescher and Webb)	.. ..	10 g.
Sodium chloride	.. .. ..	5 g.
Agar	.. ..	20 g.
Water	.. ..	to 1000 ml.

Adjust to pH 7·8 and autoclave. The agar is best distributed in 200, 400, or 600 ml. flasks. Other ingredients of the medium are: sterile horse blood (B. W. and Co.) laked by freezing and thawing; and a solution containing 0·7 g. of potassium tellurite to 20 ml. of water (this should be kept tightly corked in the dark).

To prepare for use take 200 ml. of agar melted and cooled to 50° C. (the temperature being measured by a thermometer immersed in the agar), add 2 ml. of tellurite solution and 10 ml. of laked blood and pour plates. The medium should have a wine-red colour, and acquire a mahogany colour on incubation. Spectroscopic examinations made by Dr. John Pryde showed that this change in colour is due to a partial conversion of oxyhæmoglobin into methæmoglobin. Some difficulty may be experienced in the successful laking of blood by freezing and thawing. The following methods have given best results: (1) Freeze the blood hard in a mixture of ice and salt for about an hour in the refrigerator, and then thaw in a water-bath at 37° C. Do not shake the blood either during freezing or during thawing. One freezing is usually enough but it may occasionally be necessary to repeat. (2) Distribute the blood in screw-capped bottles which should not be more than half full and place them horizontally in the freezing element of the refrigerator and leave overnight. Thaw out next morning and repeat daily until completely laked. Two freezings are usually enough. Laked blood is best stored in the frozen state when it will keep indefinitely. (3) If facilities for freezing are not available the blood may be laked by addition of sterile distilled water either to the whole blood, or better to the red cells after centrifuging. About 1¼ volumes of water is needed to lake whole blood. This method is not recommended where facilities for freezing are available as it introduces undesirable dilution of the blood.

PROPERTIES OF THE MEDIUM

The medium gives very rapid growth of all types of *Corynebacterium diphtheriæ*, and diagnosis is always possible after 18 hours' incubation. Plates should be examined between 18 and 20 hours after inoculation. The morphology of *C. diphtheriæ* is not seriously modified by the medium, so that in cases of doubt diagnosis can be made by examining gentian-violet stained films from the tellurite, the diphtheria bacilli showing a typical appearance. Neisser-stained films are less satisfactory. The selectivity is good and the medium will stand heavy inoculation. In particular *C. hofmannii* grows much less vigorously than on most tellurite media, and *C. diphtheriæ* will hold its own on the medium against any other organism except *C. xerosis*. As a result of these properties it is quite feasible when examining large numbers of contacts to inoculate four or six swabs on one plate without any attempt at spreading. This method, however, should not be used until the worker has had some experience of the medium and is familiar with the morphological appearances of *C. diphtheriæ* on it. Ear swabs should always be carefully spread.

Type-differentiation, while inferior to that given by McLeod's medium or by Neill's, is sufficiently good to present no difficulty to anyone with experience of tellurite media. The most characteristic feature of *C. diphtheriæ* on the medium is the grey colour of the colonies, and plates should be first examined with the naked eye to pick up grey colonies which may then be examined with a hand lens to determine the type. Prof. H. D. Wright recommends the use of a binocular dissecting microscope in examining the plates. When using this method I find that the best results are given if the plate is placed on an opaque stage, the colonies being illuminated from above by daylight. Transmitted light is much less useful. The characters of the growths commonly encountered on the medium after 18 hours incubation are:—

C. diphtheriæ (gravis).—Grey colonies, 1·5–2·5 mm. in diameter, with a dull matt surface. May be slightly umbonate

and show indented margins. Colony can be pushed along the surface of the medium with a loop.

C. diphtheriæ (mitis).—Grey colonies, 1·5–2 mm. in diameter, with regular margins and a shining surface. Variation in the size of colonies is common.

C. diphtheriæ (intermedius).—Small grey colonies 0·5–0·75 mm. in diameter with shining surface. Centre of colony is darker than the periphery, and colonies are very uniform in size.

C. hofmannii.—Usually shows small, rounded, white or greyish-white colonies 0·5–0·75 mm. in diameter. If the medium has been freshly prepared or if the blood is incompletely laked the growth is more profuse, colonies attaining 1 mm. in diameter. In these cases the colonies are black in the more heavily inoculated areas and white when well isolated.

C. xerosis.—Black, shining colonies of variable size.

Streptococci.—Minute black or brownish black colonies.

Others.—Occasionally gram-negative cocci, yeasts, and sarcinæ have been encountered and may present some difficulty; the colonies resemble the intermediate type of *C. diphtheriæ* but are larger. Certain sporing aerobes may grow and give brownish mucoid colonies.

VARIATIONS OF THE MEDIUM

Experiments have been made, as follows, to determine how far the formula given above can be altered without the medium losing its characters:—

The sterile laked horse blood may be replaced by ox or sheep blood, but ox blood laked by Neill's method (addition of formalin and ether) is unsatisfactory. Human blood is somewhat inferior to horse blood.

The amount of laked blood may be varied from 3 to 5%. If more than 5% is used the medium becomes so dark that it is not easy to distinguish the colour of the colonies. With less than 3% of blood the medium becomes less selective.

The blood must be completely laked. If unlaked or partially laked blood is used the growth is more profuse but the selectivity is much less good and the type-differentiation is very poor.

The concentration of tellurite can be varied within fairly wide limits, but a final concentration of 1 : 3000 gives best results.

The medium appears to owe its characteristic properties mainly to the agar basis. This cannot be replaced by ordinary nutrient agar, or by Hartley digest agar. Lab. Lemco must be used and not ordinary Lemco.

It was at first thought that the use of Difco proteose peptone was essential, other peptones tried having given very inferior results, but Professor Wright informed me that Bacteriological Peptone (Evans Sons, Lescher and Webb) gave the same results. I was able to confirm this, but if Evans's peptone is used it is important to use a sample of recent manufacture.

Experiments were also done using CCY agar as basis (Gladstone and Fildes 1940). Rapid growth of *C. diphtheriæ* was obtained but the medium was less selective than mine and the growth of the intermediate type of *C. diphtheriæ* was inferior, though the CCY medium gave more profuse and rapid growth of *C. diphtheriæ* (mitis).

RESULTS

When the medium was first introduced it was carefully compared with serum and gave the following results:—

Total number of swabs examined	1824
Total positive	464
Positive on serum	378 (81·5%)
Positive on tellurite at 18 hours ..	462 (99·6%)

Two strains did not appear on the tellurite. Both grew readily when subcultured from the serum, and the failure in those instances was probably due to faulty inoculation. It is to be noted that the serum slopes were inoculated first.

The proportion of serum positives to tellurite positives has been higher than that found by the Leeds workers (81·5% compared with 70%). This is probably due to two factors. First, in Cardiff duplicate films are made from the serum, one being stained by Neisser and one by Gram; these are examined by independent workers and then cross-checked, and as a result the serum positives are about 10% higher than they would be if only Neisser-stained films were examined. Secondly, the types of diphtheria bacilli isolated in Cardiff, being almost entirely intermediate and mitis, are easier to recognise on serum than the gravis type prevalent in Leeds.

DISCUSSION

The medium has now been in use for some eight months in three different laboratories. A number of different technicians have made it with identical and consistent results, and workers with wide experience of tellurite media and others new to such media have been able to use it with success. The main value of the medium is in the rapidity with which diagnosis can be made. The rate of growth is almost as good as on serum and the number of positives found at 18 hours is far greater than on serum. This fact, coupled with the fact that diagnostic films can be made direct from the tellurite in doubtful cases, raises the question as to whether the use of serum might be discontinued. I have not so far had the courage to abandon the serum entirely, but it is clear from these results that if serum were given up only about 1 positive in 200 would be missed, and it is doubtful if the time and labour involved in the use of serum is worth while for such a small increase in accuracy.

It is probably unwise to recommend any one medium for general use in diphtheria diagnosis since the problems presented to the bacteriologist vary very much in different areas. The observations of the Leeds workers, extending over many years, seem to leave no doubt that where gravis strains are predominant the heated blood media such as McLeod's and Neill's are the media of choice, since they seem to be better for picking out scanty gravis colonies than other media. These media, however, do not seem to be satisfactory in areas such as Cardiff where hæmatin-sensitive mitis and slow-growing intermediate strains are common. The medium described here will be found most valuable where slow-growing strains are common, and especially where the intermediate is the predominant type.

SUMMARY

A tellurite blood-agar medium is described with which diphtheria diagnosis can be made in 18 hours.

Of 464 consecutive positive swabs examined, 462 were positive on the tellurite at 18 hours, and 378 positive on serum.

The type differentiation with this medium, while inferior to certain other tellurite media, is sufficiently good to present no serious difficulty to experienced workers.

I wish to thank Prof. J. W. McLeod and Prof. H. D. Wright for helpful suggestions, and Dr. J. Pryde for spectroscopic observations on the medium.

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BERI-BERI HEART IN A YOUNG WOMAN

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A WOMAN of 22 was admitted to Addenbrooke's Hospital on June 12, 1940, under the care of Prof. J. A. Ryle. She complained of breathlessness on exertion and weakness for the past 6 months, with amenorrhœa. There had been no hæmorrhage of any kind. She had been up and about until a week before admission, though feeling tired and unfit. She was pale and thin, with a considerable brown pigmentation of skin and mucous membranes. The scalp was covered with neglected septic lesions. There was œdema of the lumbar region and also of the ankles. Tendon reflexes were absent at first but returned later. She was orthopnœic but not cyanosed. The veins in the neck were distended and pulsating. The liver was enlarged and tender but the spleen was not palpable. The heart was enlarged to left and right; there was definite triple rhythm, an apical systolic murmur, and the blood-pressure was 90/50. Pulse-rate about 110; temperature varied between 97° and 101°. Blood-count: red cells 1,370,000; Hb 14%;

white cells 11,400 (polymorphs 83%). Blood Wassermann reaction negative; blood-urea 32 mg. per 100 c.cm.; blood-potassium 16·5 mg. per 100 c.cm.; serum proteins 5·4 g. per 100 c.cm. (albumin 3·8; globulin 1·5). Vitamin-B_1 excretion test showed considerable deficiency. The urine contained albumin and large numbers of pus cells with *Bacillus coli*.

The advanced cardiac failure, anæmia, pyrexia and café-au-lait pigmentation at first suggested bacterial endocarditis but there was no evidence of embolism or valvular disease. The pigmentation of exposed parts and inside the mouth, together with the low blood-pressure, suggested Addison's disease, but this would not have explained the gross anæmia and heart failure, and there was no vomiting. The final diagnosis of beriberi heart was made because the B_1 excretion was only a sixth or less of the normal and was not increased by a test dose of vitamin B_1.

The patient was treated with vitamin B_1 (diet and concentrate) and iron in large doses; she was also given a few doses of suprarenal cortical extract. The œdema had disappeared in a fortnight and the condition steadily improved until her discharge on Aug. 10. Her husband, a labourer, had been away for some months on war service and the patient, though not obviously depressed, had been refusing to eat or to meet her friends. This may have been a schizophrenic episode, though a doctor was not called in until her condition looked desperate. During the development of her illness her diet probably contained an unduly high proportion of carbohydrate. This may help to explain both the anæmia and the production of symptoms of thiamin deficiency. She had done quite well at school so could hardly be regarded as mentally deficient. Her mental state improved considerably while in hospital, though she remained rather apathetic. There was a gain of 1½ st. in weight and her hæmoglobin was 90% on discharge.

DETERMINATION OF BLOOD-VOLUME IN SHOCKED PATIENTS

By D. K. Hill, B.A.*

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In the stress of emergency after the admission of air-raid casualties to hospital there is little time and not much justification for procedures which are not primarily therapeutic. For this reason the labile condition of secondary shock receives only such investigation as can be fitted in appropriately with the recognised treatment of the patient. Measurement of the circulating blood-volume by existing methods is either considered dangerous or involves a technique too elaborate and lengthy for use on a patient in such a precarious state. The method of determining the circulating blood-volume described here combines accuracy and simplicity with benefit to the patient.

A known quantity of blood of hæmoglobin concentration different from that of the recipient's blood is infused intravenously. The change in hæmoglobin concentration of the recipient's blood is measured, and the blood-volume before infusion can then be calculated as follows:—

Equate total hæmoglobin before and after infusion of x c.cm. of blood.

Let BV_x = initial blood-volume,
Hb_1 = hæmoglobin concentration of patient's blood before infusion,
Hb_2 = hæmoglobin concentration of infused blood,
Hb_3 = hæmoglobin concentration of patient's blood after infusion.

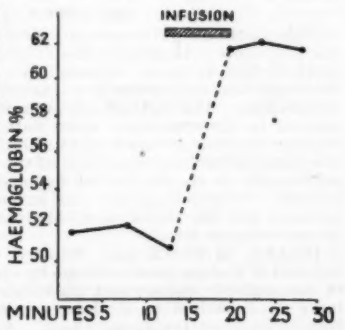
Before: Hb in patient = $BV_x \times Hb_1$
Hb in bottle = $x \times Hb_2$

After: Hb in patient = $(BV_x + x) \times Hb_3$

$$(BV_x \times Hb_1) + (x \times Hb_2) = (B_xV_x + x) \times Hb_3$$

$$BV_x = \frac{x(Hb_2 - Hb_3)}{(Hb_1 + Hb_3)}$$

Blood with a hæmoglobin concentration considerably higher than that of the patient was obtained from stored blood by removing the plasma. The infusion should be rapid and for this reason air-pressure drive is required. Drip transfusion is too slow with a fluid so rich in corpuscles. Hæmoglobinometry has been accurately done by a photo-electric method using 20 c.mm. of blood obtained from a deep stab in the lobe of the ear. It is essential to have a free flow of blood so that squeezing can be avoided. Samples are taken at short intervals before and after infusion and sampling and observational errors are thereby made insignificant.



Case 1.—Hæmoglobin concentration before and after infusion of 400 c.cm. blood.

RESULTS

Case 1.—Boy aged 16. Liver ruptured by lorry wheel. Hæmorrhagic shock after operation. Blood-pressure 60 mm. Hg. Pulse-rate 140. The hæmoglobin concentrations over the period of infusion, expressed as percentages on the Haldane scale, are shown in the figure.

Hb concentration of 400 c.cm. added blood = 95·7%
Hb concentration of patient's blood before infusion = 51·3%
Hb concentration of patient's blood after infusion = 61·8%
Calculated blood-volume = 1·29 litres.

Case 2.—Woman aged 55. Air-raid casualty, shocked after severe injury to limbs. Blood-pressure 40 mm. Hg. Pulse imperceptible. Subsequently died.

Hb concentration of 330 c.cm. added blood = 109%
Hb concentration of patient's blood before infusion = 68·5%
Hb concentration of patient's blood after infusion = 78·8%
Calculated blood-volume = 975 c.cm.

Case 3.—Man aged 35. Blood-pressure 110 mm. Hg. Pulse-rate 100. Hæmatemesis 2 days previously.

Hb concentration of 540 c.cm. added blood = 118·7%
Hb concentration of patient's blood before infusion = 32·7%
Hb concentration of patient's blood after infusion = 46·2%
Calculated blood-volume = 2·9 litres.

Case 4.—Man aged 52. Hæmatemesis a week previously. Blood-pressure 118 mm. Hg. Pulse-rate 88.

Hb concentration of 500 c.cm. added blood = 81%
Hb concentration of patient's blood before infusion = 21·6%
Hb concentration of patient's blood after infusion = 27·0%
Calculated blood-volume = 5·0 litres.

Case 5.—Man aged 50. Slow hæmorrhage over long period from gastric ulcer. Blood-pressure 124 mm. Hg. Pulse-rate 80.

Hb concentration of 420 c.cm. added blood = 100·3%
Hb concentration of patient's blood before infusion = 22·7%
Hb concentration of patient's blood after infusion = 30·1%
Calculated blood-volume = 4·6 litres.

The blood-volume is inversely proportional to the change in the patient's hæmoglobin concentration but since the change is small the error in measurement of blood-volume is almost the same as the error in measurement of the change of hæmoglobin concentration. In case 1 the accuracy (as judged from the scatter of points in the figure and neglecting other less important sources of error) is of the order ± 200 c.cm.

* In receipt of a grant from the Medical Research Council.

DISCUSSION

This method for determining circulating blood-volume has the same rationale as the commonly employed dye method but is more reliable since the added "dye" (hæmoglobin in corpuscles) cannot escape from the circulation. The method can be used with benefit to the patient in circumstances when determination of blood-volume by other means would not be justifiable, provided the hæmoglobin concentration of the added blood differs sufficiently from the initial hæmoglobin value in the patient. The method was used in two severely collapsed patients and the circulating blood-volume was found to be exceedingly low.

Bushby, Kekwick and Whitby [1] have suggested a method of finding blood-volume by observing the dilution of hæmoglobin consequent on infusion of plasma. We have used such a method in a number of cases with hæmorrhagic or traumatic shock. Considerable inaccuracies, especially in shocked patients, due to loss from the circulation of the infused fluid, may limit the value of results so obtained, unless, as Whitby and his colleagues insist, the observations are carried out immediately before and immediately after the rapid transfusion of a known volume of plasma. Hæmoglobinometry done frequently shows that about 40% of the dilution acquired after rapid infusion may be lost within 30 min. This is probably due to the fact that plasma- or serum-saline, being diluted with saline anticoagulant, has a protein content only 60–70% normal. An approximate correction for loss of fluid during infusion may be made by the construction of a curve of hæmoglobin values and extrapolation. The method might be improved by the use of serum from coagulated blood not diluted with saline.

1. Bushby, S. R. M., Kekwick, A. and Whitby, L. E. H. *Lancet*, 1940, 2, 540.

SUMMARY

Blood-volume can be determined while treatment is being given to a shocked patient by observing the change in hæmoglobin concentration after infusion of a known quantity of blood from which the plasma has been removed.

We thank Mr. A. C. Pincock for technical assistance and the chief medical officer of the L.C.C. for permission to use observations made on patients in Hammersmith Hospital.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Medicine on Jan. 28, with Sir MAURICE CASSIDY, the president, in the chair, a discussion on the therapeutic value of

Transfusions of Derivatives of Blood

was opened by Colonel LIONEL WHITBY. He said that transfusion should always be performed with a definite object—restoration of oxygen-carrying capacity, for which red cells are essential, as in the anæmias; or restoration of blood volume, for which any innocuous fluid which is well retained in the circulation is suitable. On rare occasions transfusion is used to contribute leucocytes, platelets, clotting elements, complement or antibodies. Blood derivatives are as a rule very efficient for restoring blood volume, but with the exception of stored blood are useless for increasing oxygen-carrying capacity. Including stored blood, they are useless for contributing leucocytes and serological constituents. The available derivatives are stored blood of different ages, citrated plasma, blood-serum, dried blood-serum and concentrated suspensions of red cells in physiological glucose-saline or plasma. Stored blood a few days old, cleanly and properly taken, is almost as good as fresh blood for restoring oxygen-carrying capacity. Its corpuscles are sufficiently durable to allow decantation from and re-suspension in saline or glucose-saline in high concentration. With time, the corpuscles deteriorate and may become fragile and hæmolysed. Such corpuscles do not endure long in the circulation and produce a reaction. They contribute only temporarily to the oxygen-carrying power, and are unsuitable in the anæmias. French physicians, however, have used ageing blood somewhat daringly as a means of introducing iron into the circulation, and even aged blood is useful in the emergencies of battle. Carefully-taken and refrigerated blood, to which glucose has been added, does not lose its volume-restoring properties for four weeks. When it is under a week old its oxygen-carrying power is almost equivalent to that of fresh blood. The younger the blood the greater its durability. The disadvantage of stored blood is the complexity of the apparatus required for its proper preservation. The corpuscles of young stored blood and fresh blood can be used for the preparation of concentrated red-cell suspensions for the treatment of anæmia, where the object is to produce the maximum oxygen-carrying power. Such suspensions allow an increase of hæmoglobin of approximately 20% per pint, instead of the 10% of the ordinary transfusion. In six cases the results have been excellent. The procedure is particularly advantageous in cases of true plastic anæmia leading a transfusion life, and greatly reduces the time needed for the transfusion.

Experimental work on cats (which Colonel Whitby illustrated by slides) has shown the relative properties of the various derivatives and substitutes. The effect of saline is evanescent. Respiratory embarrassment is associated with transfusion of substitute fluid but is most marked with serum. The best replacement substance, and the one adopted by the Army, is plasma-saline. For maintaining as well as restoring blood-pressure a protein-containing substance is necessary. A 25% hæmoglobin-Ringer solution is quite efficient for restoring and maintaining blood volume, but has the grave disadvantage that hæmoglobin is a foreign pigment and has to be excreted. Gum-saline is reasonably efficient for maintaining blood-pressure, but it is difficult to make two suspensions alike. Glucose is as evanescent in its effect as saline. The order of preference is: whole blood, plasma, serum, hæmoglobin-Ringer, gum-saline, isotonic saline and isotonic glucose. The only true index of the efficiency of plasma is its protein content, because the crystalloids are rapidly excreted. The plasma produced by the Army transfusion service has a protein content of 4–5%. In the treatment of over 100 air-raid casualties, 165 pints of plasma were used, and only 3 patients had mild and transient rigors. The plasma was anything up to 56 days old, and was stored in a cool room in the dark. The maximum amount given to any one case was six pints. In large transfusions it is an advantage for at least one pint in three to be blood. Army citrated plasma contains no Merthiolate preservative. Its utility for blood loss is unequivocal. Its use must be controlled by serial blood-pressure examinations. For any proper assessment of the relative value of plasma and serum, cases that have suffered comparable blood loss and comparable reduction in blood-pressure must be systematically studied throughout the transfusions, or no-one can say whether the restoration of blood-volume had been adequate, inadequate or excessive. The rise of blood-pressure that can be expected from each pint transfused is between 10 and 20 mm. Hg. The commonest cause of failure of the blood-pressure to rise quantitatively with transfusion is continued bleeding. The need for transfusion rarely ends in the resuscitation ward; the patient should be sent to the theatre with a cannula tied in a bottle of slowly-dripping blood which can be instantly accelerated if the occasion arises.

Dr. JANET VAUGHAN analysed the work of the North-West London Blood-supply Depot. Concentrated red cells, she said, are useful when it is necessary to raise the protein content without affecting the blood-volume. In assessing relative therapeutic value, relative toxicity and dosage must be considered as well as therapeutic effect; after these considerations came ease of preparation, transit and storage. Unfiltered, filtered and dried plasma and filtered, dried and citrated serum are available, but only the first two groups of plasma and serum respectively have been used in the depot. Unfiltered plasma is obtained by siphoning from sedimented red cells, preferably after five days, and not later than two

weeks. Its protein content is 4–5%. It very rarely forms clots. Filtered plasma is clear but very apt to clot. Merthiolate 1% has been added habitually to plasma to prevent infection; but disinfectant is not added to the sera, as the risk is much less. Filtered serum contains about 7% of protein. No serious reactions have followed the use of any of the preparations. Unfiltered plasma has been given to 18 air-raid and 7 civilian casualties, with two reactions of mild fever and rigor. Filtered plasma has been given to three times as many cases, again with only two reactions. With filtered serum 19 bottles have provoked two reactions; in one case the serum was given cold, which was inadvisable. With dried serum 47 infusions have produced 13 reactions, most of them very trifling and following highly concentrated injections; at normal concentrations the incidence of reactions falls considerably. Plasma, serum and blood, in all the forms, seem equally effective, as far as it is possible to assess them under blitz conditions, and there is no great difference in the dosage. Fresh blood should be given if severe sepsis is present. The only sure guide at present to therapeutic value is the rise of blood-pressure; the pulse is very unreliable. Since some anæmia has been found in most air-raid casualties, both blood and a protein fluid seem indicated. With unfiltered plasma there have been 23 good results and 6 deaths; with filtered plasma the figures are 84 and 12. Blood has been given to 30 patients successfully and to 7 who have died. An initial dose of 400 c.cm. of normal serum is satisfactory in most shocked patients. Concentrated doses do to some extent withdraw fluid from the tissues into the blood-stream and improve blood-volume, but better results are obtained with normal serum. Hæmoglobin values of 60–70% are often found in air-raid casualties. Probably it is best to transfuse with one or two bottles of plasma and then with one or two bottles of blood; 37 patients treated in this way have done extremely well. As far as possible, therapy should be controlled by blood-pressure and hæmoglobin reading. Burns should be treated by transfusion immediately. Transfusion is too often delayed for 24 hours or until after "cleaning up"; it should start before arrival in the theatre and continue all through surgical intervention and into the ward—for 24–48 hours. If protein fluid continues to drain from the patient, transfusion must go on still longer, fresh blood being used for choice. Plasma or serum are better than blood during the first 24 hours after burns, when hæmoconcentration occurs. Concentrated serum will reduce local œdema, but has proved disappointing in nephrotic œdema. Dried serum has the advantages that it does not clot, is not readily infected, is unaffected by temperature, is small in bulk. Plasma seems to be an ideal culture medium; the infection-rate is 7% even under the most rigorous conditions. There is at present no proof that its fibrinogen is important. Concentrated red cells have become almost embarrassingly popular; they are valuable for aplastic anæmia, anæmia associated with sepsis and anæmia in elderly patients requiring immediate operation. Red cells should not be used younger than five days or older than a fortnight. They last well in the circulation, except in a small group of splenomegalic anæmias. Two bottles will raise the hæmoglobin level from 20 to 60%.

Dr. HELEN BROWN said they have been unable to confirm the work of Aldrich on nephrosis; there was increased albuminuria after injection, so presumably the protein was excreted. In one case the blood protein rose for 24 hours only, and the œdema became worse.

Prof. T. B. DAVIE wondered whether cases of anæmia with sepsis should have concentrated red cells or fresh whole blood. His practice has been to give whole blood to raise the hæmoglobin to 90% as soon as possible, and thereafter to maintain this level by repeated injections of fresh whole blood from donors. In drawing blood for blood banks plasma is made available automatically, but bleeding for serum would produce difficulties.

Mr. GEORGE QVIST related the cases of two firemen with second-degree burns of the hands and face with severe blistering. There was no real shock and blood-pressures were about 150. The burns were cleaned up and treated with continuous saline. Next morning, one was doing well and the other showed a severe fall of blood-pressure and a hæmoglobin of 132, with severe œdema of hands and face. He was given repeated infusions of concentrated serum—about 620 c.cm. of four-times concentrated—and each time the blood-pressure stayed up for about half an hour. In 24 hours, however, the anxiety was at an end. The case illustrated Dr. Vaughan's statement that all burns should be treated with transfusion straightaway.

Dr. MONTAGUE MAIZELS agreed that serum may be theoretically better, but plasma from blood banks has much to recommend it, and infection is not a serious factor. A separate outfit should be used for each bottle, to avoid transferring infection, which can then be cut down to 5, or even 2%. Merthiolate is an absolute snare; it obscures the issue. Unfiltered plasma, being cloudy, makes detection of infection more difficult, but filtered plasma is a beautifully clear fluid and as long as it is translucent it is pretty surely not infected.

Dr. P. L. MOLLISON said that there is a distinct disadvantage in having a suspension containing more than 7½ million red cells in concentrated preparations, since they then become too viscous to flow.

Colonel WHITBY, in reply, said that treatment of secondary shock is an entirely individual matter. He agreed that merthiolate is a snare.—Dr. VAUGHAN also briefly replied.

Reviews of Books

Industrial Hygiene

By A. J. LANZA, M.D., assistant medical director, Metropolitan Life Insurance Co., New York; and JACOB A. GOLDBERG, Ph.D., secretary, Industrial Hygiene Committee, New York Tuberculosis and Health Association. London: Humphrey Milford, Oxford University Press. Pp. 743. 42*s*.

THE interest taken in industrial medicine and hygiene had been growing steadily during peace-time, but a sudden fillip has been given to it by the war. More medical men are being appointed to look after the health of factory workers and they are meeting problems which differ in many respects from those of ordinary medical practice. A real need has arisen for an up-to-date and authoritative textbook on the subject, and since a complete survey appears to be beyond the scope of one individual the ideal textbook on industrial medicine should be the work of a team of experts. The many facets of the work are well shown in this new book on industrial hygiene from the United States. It deals almost entirely with American industrial conditions which differ in many respects from ours. It will have a limited value for British readers, but should not be neglected on that account. Its 21 chapters include a good one by Selby on the scope and organisation of health services in industry, and Woodruff deals adequately with the physical examinations of employees. Weeks contributes a useful section on the care of the eyes in industry, and Bowman writes about the mental hygiene of factory workers. Other chapters cover traumatic surgery (Moorhead and Slattery); physical therapy (Bierman); rehabilitation of the injured worker (Kessler); silicosis and asbestosis (Lanza); skin diseases (Schwartz); industrial poisoning by the heavy metals (Reznikoff) and by gases and fumes (von Oettingen and Sayers); lighting and atmospheric control (McConnell); and the place of the nurse in industry (Rosamund Goldberg). J. Burns Amberson's chapter on tuberculosis and other pulmonary diseases is a concise account which would take a place of honour in a textbook of medicine. Wright's chapter on peripheral vascular disease is made valuable by its relevant case-histories, and Foster Kennedy's article on the nervous conditions resulting from injury sparkles with erudition, humour and wisdom. The editors are to be congratulated on having cast such a wide net but some of the catch might have been thrown back into the sea. Lanza's own chapter on silicosis and asbestosis is one of the shortest in the book and might well be expanded in the next edition; whereas those sections written by contributors who have had little contact with industry could be shortened to make a more balanced book.

Outlines of Industrial Medical Practice

By HOWARD E. COLLIER, M.D. Edin., formerly reader in industrial hygiene and medicine, University of Birmingham. London: Edward Arnold and Co. Pp. 440. 21*s*.

Dr. Collier has made a valiant attempt to cover the field of industrial medicine; in five main sections he deals with the executive and advisory functions of the works doctor, industrial psychology, industrial medicine, and industrial forensic medicine. He insists, quite properly, that the book is only an outline; but it would have been better to omit all reference to the safety provisions of the Factories Act 1937 unless he had been prepared to deal with them fully; over-compression has given an erroneous idea of the requirements of Part II. It is just as important for the works doctor to know about such matters as air receivers, steam boilers, cranes and hoists as that he should be told that a fixed vessel containing boiling or corrosive liquid should be covered or have a guarding rail three feet high. And in the description of the duties of the examining surgeon the Home Office instructions quoted are those of 1933, the important changes made by the 1937 act being ignored. The chapter on accidents and safety is inadequate even in an outline and two of its six pages are given up to accidents in sewers, rather a far cry from factory experience. The section on the keeping of health records will be of more use to the works medical officer than the lavish space devoted to the psychology of the individual and the group. Some of the rather numerous inaccuracies may be due to careless proof-reading, as for example the statement that good results in the treatment of carbon-monoxide poisoning are obtained from the use of 93% CO_2 and 7% O_2, but not the failure to mention the Mark IV dust respirator while recommending less efficient types. And the lapses are the more to be regretted as the work is logically planned and well set out.

Health and Efficiency of Munition Workers

By H. M. VERNON, D.M. Oxfd, formerly investigator for the Health of Munition Workers Committee and for the Industrial Health Research Board. London: Humphrey Milford, Oxford University Press. Pp. 138. 8*s*. 6*d*.

Dr. Vernon's pioneer investigations have often been referred to in these columns. He has shown that many munition workers suffered from sickness and loss of efficiency owing to unfavourable conditions and long hours of work. It is not likely that the errors committed during the last war will be repeated in so gross a form during the present one, but some of the lessons learned will probably be forgotten or ignored. Dr. Vernon has therefore thought it worth while to recapitulate briefly in book form the evidence collected by the committee and the remedies which were then suggested. Although the book contains no new work and nothing which cannot be found in Dr. Vernon's articles and larger books, or in the publications of the Industrial Health Research Board, it is to be recommended to works doctors and factory managers on account of its handy size and its concise and accurate presentation of the subject matter.

Synopsis of the Principles of Surgery

By JACOB K. BERMAN, M.D., F.A.C.S., assistant professor of surgery, Indiana University school of medicine, Indianapolis. London: Henry Kimpton. Pp. 615. 25*s*.

SOUND surgery is built on anatomy and physiology, pathology and common sense, and a good textbook must observe the fundamentals if it is to have a right perspective. Judged by these standards Dr. Berman's book is fairly successful. The strong emphasis on physiology will be appreciated by the student fresh from his preclinical course for it forms a natural link between the laboratory and the bedside. The general arrangement of the book is not out of the ordinary. After a short historical review there are chapters on pathology, bacteriology and general surgical subjects. Then follow three chapters on the constitutional factor, the interchange of body fluids and the acid-base balance, subjects which often receive scant attention in surgical textbooks. The remaining chapters cover the field of surgery as applied to the various systems of the body. The general problems of burns are well presented but the discussion of treatment is not so good, and Dr. Berman's statements about blood-transfusion, continuous immersion, and the incidence of suppuration under tannic-acid crusts are open to question. There are many footnotes in which special points are elaborated, illustrated and discussed, the continuity of the main text being thus uninterrupted. Diagrams and photographs are plentiful and on the whole excellent, and there are numerous references.

Medical Electricity for Massage Students

(2nd ed.) By HUGH MORRIS, M.D. Belf., D.M.R.E. London: J. and A. Churchill. Pp. 394. 18*s*.

IN the new edition of his book, which will continue to be of great use to the massage student for examination purposes, Dr. Morris gives a workmanlike summary of the subject, and provides a good practical foundation for the use of medical electricity. He explains well-established facts without unnecessary and confusing theorising. The description of apparatus, and the practical details for the application of treatment are good. Ultraviolet-light treatment is fully described, diathermy and short- and long-wave therapy more briefly. A chapter on diseases and their treatment he admits to be less detailed than might be wished but in a work of this size it is not possible to describe all the uses of medical electricity. The value of the various treatments is fairly assessed. A useful glossary and a good index are included.

Modern Diagnosis

Edited by Sir HUMPHRY ROLLESTON, Bt., M.D., F.R.C.P., and ALAN A. MONCRIEFF, M.D., F.R.C.P. London: Eyre and Spottiswoode. Pp. 286. 12*s*. 6*d*.

THIS is the fifth of the Practitioner Handbooks and consists of a number of recent contributions to the *Practitioner*, reprinted, revised, and supplemented by one or two new chapters. The first nine articles are on purely clinical subjects, such as the tongue, the nails, pain in various situations, swellings and sinuses in the neck in childhood; the other eleven are on laboratory subjects. The contributors are all well-known authorities, and their aim is to remind and inform the general practitioner in simple practical style. The clinical articles are the more successful; all are good, and those on abdominal pain by Mr. W. H. Ogilvie and on cervical swellings and sinuses in children by Mr. Charles Donald specially so. The laboratory articles discuss both those procedures which the practitioner may reasonably be expected to undertake himself (though here it is curious that the benzidine reaction for occult blood in stools is omitted), and those which he may wish to understand, though their performance is a matter for the trained laboratory worker. Here there are some misleading statements. Dr. S. C. Dyke and Dr. Eileen Harvey state that "a high proportion of sufferers from erythema nodosum give a positive reaction" to a Mantoux test, "thus demonstrating the tuberculous origin of the condition," although they have already explained that a high proportion of healthy subjects, after early childhood, react positively to this test. Dr. R. G. Waller points out that the Sonne bacillus is a common cause of dysentery in this country, and "here again the results of bacteriological examination of the stools should be supplemented by agglutination tests of the blood": for diagnostic purposes this advice will lead to little but a waste of time and money. On the whole, the laboratory articles are written on the assumption that the practitioner sends material or even the patient to the laboratory for examination, and receives a report. That is why, although usually sound, these articles are not entirely satisfactory. Except in respect of the simplest and best standardised procedures, the clinician, be he practitioner or specialist, seldom knows as well as the pathologist just what examinations are most likely to throw light on a given patient's case, or just what light they do throw in that particular case. The aim, therefore, should be personal contact between clinician and pathologist in all but the simplest problems. It is difficult to achieve that in present conditions of practice, but short articles such as these are an inadequate substitute for it. They rather encourage that penny-in-the-slot pathology which wastes so much of the laboratory's time and the patient's money, and may easily miss the solution of the clinical problem.

THE LANCET

LONDON: SATURDAY, FEBRUARY 8, 1941

OVERTIME AND OVERTIRING

WHEN a north-country firm was summoned last month for working boys longer than the law allows the magistrate dismissed the case on the ground that such prosecutions were likely to impair the war effort. The Minister of Supply had given the firm carte-blanche to do as they liked. We have all taken this question of war effort so much to heart that we have forgotten the first principle of conserving energy. It is not the man who digs his garden most violently on the first day of spring who gets his digging done first. Mr. J. H. MIDDLETON has told us before now the story of his too eager uncle whose indulgence in digging led to blistered palms and a sharp attack of lumbago, and this beautiful analogy fits like a glove the case of overtime in industry. It seems incredible that we should be learning again, by experience not precept, the lesson which the last war made so painfully lucid. In 1916 we were told[1] that munition workers had "been allowed to reach a state of reduced efficiency and lowered health that might have been avoided without reduction of output by attention to the details of daily and weekly rest." In 1941 the same criticism holds good in many factories. Employers have not been able to realise, even yet, that working to capacity does not mean working each man, woman and young person for as many hours as he or she can stand at a machine.

The hours worked by women and young people under 18 are controlled by law, and factory inspectors have power to regulate them. The factory department of the Ministry of Labour has set its face against young people between 14 and 16 working more than 48 hours a week at the outside, even where their services make for the smooth running of a team; and this standard was laid down within five months of the outbreak of war.[2] Yet this standard is being overriden in some places, as the court case mentioned above shows. Women too are still being overworked in some industries. The subcommittee on supply services, whose report was presented to Parliament during January by the Select Committee on National Expenditure, found that in Glasgow women were being asked to work in munition factories seven days a week; and that they left home at 6 in the morning and did not get back till 11 at night. Many had to give up industry because it was impossible to run their homes or make domestic purchases. Thus their services, instead of being used economically for the advantage of the country, were lost completely. But on the whole firms have conformed to the department's standard for women and young people. It is upon grown men that the heaviest burden of overtime is falling and the Government has no legal control over the hours they work. That they are suffering under the strain is evident from their own accounts—one of our peripatetic correspondents recorded his conversation with an overtired man last week (p. 157)—and from the subcommittee's finding that the lessons of the last war "seem largely to have been ignored." This despite the Ministry of Labour's circular of July which recommended an immediate reduction to an average of 55 or 56 a week as soon as the necessary labour force had been acquired. After Dunkirk many factories were working 24 hours a day seven days a week. Within two months the effects of strain appeared in the workers, shown by increased sickness and absenteeism. Fatigue was proving, as usual, a cardinal factor in reducing resistance to infection.

Unfortunately the question of overtime is intricately bound up with the interests of the fighting services, the trade-unions, the employers and the workers themselves. The hours worked by men over 18 are regulated mainly by agreement between employers and trade-unions, and most munition workers belong to unions. Both employers and unions prefer that the regulation of hours should be in their hands, the unions because they naturally like their members to be able to earn more by working overtime. The fact that overtime is paid at the rate of time-and-a-half on week-days and double pay on Sundays has made some difficulties. The subcommittee mentioned above found that Sunday labour leads men to take a day off in the middle of the week, when they only lose an ordinary day's pay and earn double pay on Sunday to make up for it. It is difficult to blame them for this; they are human, living is costly, and they realise that they must take a day off each week if their health and output are not to suffer. Wise employers realise that there is a direct relation between long hours and absenteeism. One managing director put it like this: "You want output: I'll give it to you. But please don't try to tell me how it is to be done. I know that if I overwork my men the output will fall." His firm made tanks. In many cases managers have deliberately reduced hours to increase output. The subcommittee found that in the Royal Ordnance factories absenteeism during the summer drive rose from 10 to 15%; in July it was decided to discontinue Sunday labour wherever possible, and often Saturday afternoon labour as well. Time-keeping improved at once and production did not suffer; indeed one factory, after the reduction of hours, set up a new record for a week's production.

On mere economic grounds we cannot afford this extravagance of overtime; it is enough to recall the proof in the last war that abnormal overtime increases cost out of all proportion to the increase in production and the subcommittee are of the opinion that it is having the same effect now. They point out that the Ministry has used its compulsory powers to a very minor extent. They endorse an immediate reduction of hours to the level recommended by the Ministry and they think no undue delicacy should be allowed to interfere with this necessary change. Mr. ARTHUR WOODBURN, who is a member of the subcommittee, said in Parliament last week that efficiency in war and industry depended on Parliament's policy being carried out on personal responsibility. Committees cannot carry things out but persons can. It is up to the firms to see to it that the Ministry's advice is followed. The three-shift system advocated by the subcommittee would safeguard the health of the workers and ensure maximal output.

1. Committee on the Health of Munition Workers. Memorandum VII, 1916.
2. Report on hours of employment of women and young persons in factories during the first five months of war. Cmd. 6812, H.M. Stationery Office, 3*d*. See *Lancet*, 1940, **1**, 505.

TRICHINIASIS

THE gentlemen of Wolverhampton, wrote GEORGE BORROW in "Wild Wales," are very fond of pig. And now their appetite has let them down, for trichiniasis has broken out there. Already more than 80 cases are being followed up, and the total, including subclinical cases, may run into hundreds. Fortunately no deaths have so far been reported. Trichiniasis was suspected when the first few severe cases arrived in hospital some weeks ago, but as more cases arose it was found that the disease was attacking four women to every man and was limited to the artisan districts of the town. This suggested some obscure occupational disease, but the diagnosis was put beyond doubt by the recovery of *Trichinella spiralis* in muscle tissue. It is a common practice among the poorer people in that part of the country to eat sausage-meat raw, spread on bread as meat paste, and women are particularly partial to the delicacy; this may account for the sex incidence and distribution of the epidemic, but bacon, pork, brawn and pork pies have not yet been cleared of suspicion. Meanwhile the public have been warned to cook all pork and pork products thoroughly, and if this is done there should be no danger, since the larvæ will not survive heating to 160° F. Large quantities of home-produced as well as imported pigs are distributed from Wolverhampton, and, besides adding to the difficulties of tracking down infected animals, this suggests that doctors in the Midlands and elsewhere should be on the watch for the disease.

Trichiniasis is not unknown in England where it was discovered by PAGET when a medical student.[1] There have been small outbreaks in the past and cases may have been commoner than is thought, since the protean symptoms make diagnosis difficult. Of our fauna only the pig, rat and man are susceptible, and in man the disease is always acquired by eating pig flesh containing the encysted trichinella larvæ. The cysts are not easily detected in pork, for they are invisible to the naked eye unless they are calcified, when they appear as minute white specks. The textbooks describe three stages of the disease in man. In the first, the stage of invasion, the gastric juice dissolves the cyst walls, the embryos mature and breed in the small intestine, and the female burrows into the mucosa and deposits embryos directly into the lymph-spaces; this stage is characterised by vomiting and diarrhœa. Next comes the stage of invasion, in which the larvæ reach the blood-stream and ultimately the skeletal muscles; this is characterised by fever, eosinophilia, muscular pain and allergic symptoms, of which swelling of the face is the most prominent. Finally, in the stage of encystment the larvæ are surrounded by lime salts, which do not necessarily kill them, since encysted larvæ are said to have remained alive for 25 years; and the muscular pains subside, though the patient may still suffer from toxæmia and become increasingly wasted.

In the Wolverhampton epidemic only about one case in twenty has had any of the gastrointestinal symptoms of the first stage, though more have had abdominal pains. In nearly all the earliest symptom, after a few days' fever, has been swelling of the eyelids with headache. Influenza has naturally been the commonest diagnosis at this stage, and the puffy face suggests nephritis, more so because there may be blood and albumin in the urine for a few days. After seeing several puffy faces the doctor is in danger of seeing them everywhere, and when in doubt it may be wise to hand the patient a mirror and let him judge. Eosinophilia appears soon after invasion, and the Emergency Public Health Laboratories are there to help by doing blood-counts free for these patients. Three or four days after the initial swelling come pain, stiffness and weakness of the muscles, which compel the patient to lie up if he has not already done so, and may be very severe. Later symptoms are confusing because they are so varied. If the parasites find their way into the central nervous system there may be symptoms corresponding to the region affected—paralysis of the limbs, ataxia, blindness, or psychosis, as the case may be. Some cases run a course resembling typhoid fever; others mimic pneumonia. Petechial hæmorrhages under the finger nails and into the conjunctivæ at the borders of the iris are distinctive though inconstant signs. In suspected cases—and any patient with acute swelling of the eyelids should be suspected—a blood-count should be done early, and the presence of eosinophilia should be sufficient ground for informing the medical officer of health; the disease is not officially notifiable, but the M.O.H. relies on general practitioners to keep him informed of any obscure disease of epidemic character. Precipitin and skin tests, using ground-up larvæ as antigen, were found the most trustworthy diagnostic aid by AUGUSTINE[2] in America, and reliable specific laboratory tests would be welcomed by the clinician in the present outbreak.

1. Memoirs and Letters of Sir James Paget, London, 1902, p. 55. See also p. 201 of this issue.

ENTERIC CARRIERS

IN countries employing modern methods for the disposal of sewage, carriers as distinct from cases of enteric fever are the most important reservoirs of infection. From 2 to 5% of cases become convalescent carriers, and since such carriers are more likely to be detected than contact carriers they have received more notice. VAUGHAN[3] recently reported 6 carriers among 32 contacts of paratyphoid B—an unexpectedly high proportion. Even in diphtheria such figures would be regarded as high, and the opportunities for contact infections in that disease are much greater than in enteric fever; for in diphtheria transmission is direct from person to person, whereas in enteric fever it is indirect or mediate, some contaminated article of food or drink being immediately responsible. It is probable that VAUGHAN'S paratyphoid carriers were not infected from the cases, but that both cases and carriers were infected from the same source. If this was so, the term contact here is a little misleading. The relative frequency of contact and convalescent carriers is of considerable epidemiological interest, but from the point of view of spread of the disease the distinction between temporary and chronic carriers is much more important, since the persistent or chronic carrier is the most dangerous as a disseminator of infection. It was a striking feature of VAUGHAN'S 6 convalescent carriers that 3 became chronic. This proportion must not be taken as representative, for

2. Augustine, D. L. *New Engl. J. Med.* 1937, **216**, 463; see *Lancet*, 1937, **2**, 750.
3. Vaughan, A. C. T. *Lancet*, Jan. 11, 1941, p. 59.

such small numbers are unlikely to be a true sample. Further investigations along the same lines are wanted if the importance of the contact carrier is to be properly assessed. VAUGHAN'S investigation emphasises that in enteric fever, as in other infectious diseases, many more of the population are infected than fall ill with the disease.

The factor commonly responsible for the persistence of the carrier state is the existence of some chronic abnormality, usually inflammatory, of the tissues in which the organism is carried. In typhoid and paratyphoid carriers the habitat of the organism is commonly the biliary or intestinal tract, bacteria being excreted in the fæces; if the urinary tract is involved the urine is infectious. In this issue MACDONALD suggests that the reticulo-endothelium of bone-marrow constitutes an important depot. He records two cases in which the organism was recovered from sites other than the biliary-intestinal and urinary tracts. In each case *Bact. paratyphosum* B was found in bone-marrow and in a local suppurative lesion. In the first patient the organism was recovered from the bone-marrow more than four months after the onset of the disease—long after other bacteriological examinations were negative, thereby confirming LING'S[4] observations on the value of sternal medullo-puncture. Attention was directed to the possible existence of the carrier state of the development of the subcutaneous abscess two months after the patient's apparent recovery from the disease. In both cases the information yielded by bacteriological examination of pus from apparently ordinary abscesses emphasises the importance of such examinations as a general surgical principle for all suppurative lesions, no matter how trivial. So far as enteric carriers are concerned, the cases draw attention to the occurrence of unusual foci for the organism[5] and to the necessity for investigating all discharges in a suspected carrier. The epidemiological importance of depots in bone will depend on the paths by which the organism leave the depot and the frequency of such an occurrence. In MACDONALD'S cases suppurating foci appeared, and, after surgical intervention, the organism was discharged, in the one case through the skin, and in the other through the vaginal fornix—both unusual events. But MACDONALD postulates that the gall-bladder, usually regarded as the most important primary reservoir in carriers, may also be secondary to a medullary reservoir, in which case the importance to be attached to bone-marrow depots will be great. They will also offer an explanation of such uncommon complications as post-enteric spondylitis, perichondritis, periositis and osteomyelitis.

The diagnosis of the carrier state depends on detection of the organism in an immune person. The first of these criteria usually involves examination of the dejecta, but the possibility of unusual foci and of medullary reservoirs must be remembered; the second criterion involves the performance of agglutination tests, neither of which is infallible. Although a positive Widal test is regarded as evidence of immunity, it is in fact merely an estimation of circulating antibodies, not of tissue immunity. It is nevertheless a reliable index in most chronic carriers, though not in temporary ones; the same is true of tests for Vi-agglutinins in typhoid carriers. Intermittency in the discharge of organisms from the reservoir may result in negative bacteriological findings in a dangerous carrier, even when the specimens are collected under the most favourable conditions. The search for a carrier responsible for an outbreak may involve the examination of a large number of contacts. Practical difficulties arise in the collection of dejecta from healthy persons, and the task would be still more formidable if a widespread examination of the population were attempted with a view to reducing the endemic prevalence of the disease. A method for limiting the number of such examinations consists in carrying out a preliminary agglutination test, since the collection of a small quantity of blood is simpler than the collection of suitable specimens of dejecta. Examinations for bacteria are limited to those persons whose blood-serum agglutinates enteric organisms in a titre of 1:10 or higher. The presumption is that this group will include the carriers; but the fallacies of agglutination tests in carriers must be remembered. Nevertheless, the method is a good initial procedure when complete examination of all contacts would be an overwhelming task. Once the field is narrowed down, bacteriological examination of fæces, urine, discharges and, if LING'S work is further confirmed, bone-marrow will be necessary. Modern war may interfere with the sanitary disposal of dejecta and the provision of pure water, even in big cities, or danger may arise from contamination of water by damaged sewers. In such circumstances cases of enteric fever might again become more important as disseminators of infection than carriers—a situation which would, but for preventive inoculation, put back control of the disease half a century.

4. Ling, C. C., Taur, S. S., Hsueh, P. C. and Yang, S. Y., *Chin. med. J.* 1940, **57**, 11; see *Lancet*, 1940, **2**, 169.
5. See Browning, C. H. et al. *Sp. Rep. Ser. med. Res. Coun., Lond.* No. 179, 1933.

PLANNING INSTEAD OF DAMNING

IT is sad that the Medical Planning Commission, which Dr. ALFRED COX described[1] as a fine New Year's gift to members of the B.M.A., should have been looked in the mouth by so many of us, but good may come of this critical spirit if it is directed not to proving the commission a foregone failure but to making it an unexpected success. Apart from regrets about its length of tooth it has been suggested that the commission contains too few country and insurance practitioners; that present members of the Services, who will be materially concerned with the commission's schemes when they return to civilian practice, have no chance of helping to form them; that financial experts, whether bankers or economists, should be included, and some would add industrialists, a trade-union leader, an architect, and perhaps a romanticist or even a patient; that there should be representatives of the left wing, and that the Medical Practitioners' Union should be able to express its views. Some of these deficiencies can be remedied by the coöption of new members, though the younger men who are away at the war can only make themselves heard by proxy. From all these opinions, however, the suspicion peeps out that we do not really believe that the findings of any purely medical body will or should be allowed to decide the future of our medical services, and this view was crystallised in Sir ERNEST GRAHAM-

1. *Brit. med. J.* Jan. 11, 1941, p. 61.

LITTLE'S [2] request in Parliament for a Royal Commission, to which the Prime Minister replied in terms which indicated only too clearly the probable burying-place of the B.M.A. commission's findings. Meanwhile what can we outsiders do to help? Just now there are many gatherings of doctors, young and old but especially young, which might find it a better exercise to devise their own plans for medicine or any of its branches than to find fault with the B.M.A.'s, and we would gladly grant them space for such reasoned forecasts as the one printed on p. 187 of this issue.

Annotations

ERYTHEMA NUCHÆ

MANY of us have been asked by the mother of a new-born baby to explain the significance of a red staining of the skin in the occipital region or on the eyelids. The inevitable maternal fear that the condition is a "birth-mark" is either expressed in the question or at any rate is the cause of the questioning. The old hand will be able to give reassurances because he has often seen the condition, has observed that it certainly becomes no worse as the infant grows older, sometimes even disappearing from the facial region and being conveniently hidden in the occipital areas. The inexperienced, on the other hand, may be doubtful about what looks at first sight like a large port-wine stain and for this reason some observations by F. Ray Bettley [3] are worth noting. Bettley uses the term erythema nuchæ but admits that the lesions bear some resemblance to a nævus and are probably only different in degree from a mild type of port-wine stain. He examined over 150 infants in the maternity department of Cardiff Royal Infirmary and found this variety of erythema in three quarters of them, the sexes being equally affected. The commonest situation was the occiput (84%) where it was usually symmetrical and measured 1–2 in. across, but the occiput was only involved alone in about 40%, other situations in order of frequency being eyelids, forehead, posterior fontanelle, lip, retro-auricular region, parietal region and vertex. Various combinations were common and the lids only, for example, were involved in 8 cases. The incidence of definite hæmangioma was much less, 7 cases including one with a minute spot, occurring in the group of infants examined. Searching for a possible cause of the erythema Bettley tested the theory of pressure by studying the obstetric records in some detail. Beyond showing a slightly increased incidence among the children of primiparæ, however, and some correlation between the type of presentation and the side of the eyelid involvement, where this was unilateral, the evidence was not convincing and the pressure theory is left unproven. As regards prognosis Bettley examined an unselected series of 60 adults attending the skin department of the Cardiff Royal Infirmary, and found that half of the men and more than half of the women had some degree of erythema in the occipital region. The eyelids and forehead were normal in every case. In most instances the erythema was slight and its existence was unknown to the patients or their parents, but in 4 cases it was more definite. It may be concluded from these observations that erythema nuchæ requires no treatment, that when affecting the facial regions it disappears spontaneously and in the occipital region usually tends to diminish in intensity. Its ætiology is unknown, but the alarm it may cause in the new-born baby's relatives can justifiably be dissipated.

2. See *Lancet*, Feb. 1, 1941, p. 163.
3. *Brit. J. Derm.* 1940, **52**, 363.

VITAMIN C ON THE MARKET STALL

As the result of Miss Olliver's [1] work on the decrement of vitamin C in fruits and vegetables in the 24 hours after they are gathered it has been rashly assumed that the green vegetables exposed for sale in the East End of London three or four days after picking are almost completely devoid of vitamins. This Miss Gweneth Chappell [2] has now shown to be entirely false, in a study of the vitamin C content of greengroceries on sale at cheap and more expensive markets. It is true that in the majority of the 58 foods she investigated there is somewhat more vitamin C in those from an expensive market than in those from stalls, but in many cases—e.g., the cabbage, tomato and radish—there is significantly less. It was easy enough in 1939–40 to obtain a day's ration of 30 mg. of ascorbic acid in a cheap market by the expenditure of a farthing (brussels sprouts, black currants, curly kale, lemons, oranges, spring greens, savoys, turnips and watercress) to three farthings (ripe banana, grape fruit, onion, parsley). "It appears," concludes Miss Chappell, "that avitaminosis occurring amongst those of limited means is due to an improper dietary, caused by poverty and ignorance, rather than to an insufficiency of ascorbic acid in the foods purchased on the open market." She confirms that fruits and vegetables bought in the open market have less ascorbic acid than freshly cut garden produce, and that the decrement is greatest in sprouts, potatoes and peas, while black currants, gooseberries and raspberries do not show so great a loss, and she calls attention to the importance to the health of the nation of encouraging allotment schemes. Now that our main foreign sources of ascorbic acid have largely disappeared from the markets, this is even more important.

THE SEARCH FOR CHEMICAL CARCINOGENS

EVER since cancer-producing chemicals were made in a laboratory by Kennaway and Cook, efforts have been renewed to find these or similar substances under natural conditions within the body. Kleinenberg, Neufach and Shabad [3] now claim that they have done so. In a series of well-controlled experiments on large numbers of mice they found a variety of tumours following the subcutaneous injection of extracts of human livers. The livers were obtained from patients who had died with malignant disease elsewhere in the body. In the control experiments they were derived from those who had died of other causes. Details are given of the method of extraction, of injection and of the general and local reactions in the mice. The number and nature of the tumours which occurred in stock mice at the same time was also recorded. In the group injected with liver extract from cancer-bearing subjects the incidence of tumours was 57·4% in mice which survived for eight months, of which 45·3% were lung adenomata; of those injected with liver extract from non-cancerous subjects 24% bore tumours, of which 26% were lung adenomata; and among the stock mice surviving for eight months there were 10·3% bearing tumours, of which 8·48% were lung adenomata. The rise in incidence of tumours in both the experimental series is impressive. An equally striking feature is their great diversity. Only six were seen at the injection site, and these were varied. All the others were found at a distance in skin, mammæ, liver, thymus and maxillæ, and their histological characters were also different. In respect of the diversity of type and origin of tumours the response to liver extract was thus unlike that which is known to follow injection of the synthetic chemical carcinogens with the exception of some azo

1. *J. Soc. chem. Indust.* 1936, **55**, 156.
2. *J. Hyg., Camb.* 1940, **40**, 699.
3. Kleinenberg, H. E., Neufach, S. A., Shabad, L. M. *Amer. J. Cancer* 1940, **39**, 463.

compounds. Usually a tumour forms with considerable regularity at the site of application—a sarcoma if injected, an epithelial tumour if painted on the skin. Tumours due even to dimethylaminoazobenzene, however administered, have a site of predilection—the liver—in which epithelial tumours appear regularly. Other organs are less often affected. Kleinenberg and his colleagues have thus succeeded in raising the total incidence of spontaneous tumours in mice by means of liver extract, of producing a great diversity of growths and of raising the incidence of lung adenomata which were already plentiful in the strain. The greatest rise followed extracts of livers from cancer-bearing patients, but the response of tumour formation was not limited to these. It may be argued that all the patients who died without signs of cancer were nevertheless potentially cancerous. For this reason children's livers would have provided a better control. It is also perhaps worthy of note that the livers from which the extract was derived did not themselves bear tumours during the life of the patient, though, by way of the blood-stream, these livers must have been subject to repeated applications of the hypothetical endogenous carcinogen which later on was extracted from them. There are difficulties in accepting it as proved that the livers from cancer-bearing subjects contain in life naturally occurring substances capable of inducing cancer. The character of the stock played too great a part in the enormous rise, and the extract lacked specificity. It is as though the claim that dibenzanthracene is a carcinogenic agent had been founded on the raised incidence of lung adenomata which it brings about rather than on its local action at the point of application.

Some preliminary experiments recorded by de Ligneris[4] show again some lack of specificity in response to extract derived from cancerous livers. Papillomas and a few carcinomas followed skin painting with extracts from both cancerous and non-cancerous Bantu livers. Two papillomas, one of which was malignant, developed after application of the non-cancerous extract; five papillomas, one of which was malignant, followed the cancerous extract. No extracts of European livers, however, gave rise to any tumours. As in the former experiments, children's livers would have provided a better control, but these may not have been obtainable. So far the data point to a cancer factor in livers whether from non-cancerous or cancerous subjects or to the development of one during handling in the laboratory. Human liver extracts examined by Hieger[5] gave similar non-specific results. This work appears to have reached a stage where obscurities might be cleared up if performed wholly on animals. The proportion of tumours likely to follow injection of liver extract from normal or non-cancerous mice should offer no difficulty except the quantitative one. Any increase in tumours attributable to the cancerous nature of their owners could also be found by pooling all livers over a period of time from cancer-bearing stock mice. The influence of either extract on the incidence of spontaneous lung adenomas could be controlled better by using a strain in which this tumour was known to be low.

CONGESTIVE HEART FAILURE

ACCORDING to Dr. Samuel A. Levine[6] the improvements in the last twenty years in the treatment of heart-failure have come not so much from any notable new discoveries as from a more intelligent and effective use of old remedies. This is true up to a point, but there have been advances which have changed our lines of treatment, for this period has seen not only the increasingly rational use of digitalis and the recognition of the limitations of oxygen therapy and venesection but also the introduction of the organic mercurial diuretics. Moreover, as Levine says, we have come to realise the vitally important differentiation of peripheral from central circulatory failure, and that to ply the unfortunate victim of lobar pneumonia complicated by peripheral circulatory failure with digitalis and diuretics is not only useless but often definitely harmful. The significance of thyrotoxicosis in the ætiology of heart-failure, particularly with auricular fibrillation, has also been more generally recognised, and Hay among others has pointed out that in patients with thyrotoxic heart-failure the thyroid enlargement may not be detectable clinically, though this is no reason for recommending subtotal thyroidectomy in all cases of heart failure of doubtful origin. Kinsey and White,[7] too, have clarified the ætiology by their finding that fever, however slight, in congestive heart-failure is evidence of some complicating condition, the commonest being pulmonary infarction, pulmonary infection (especially bronchopneumonia), active rheumatic infection, and coronary thrombosis.

In the management of congestive heart-failure we still rely on the triad of rest, digitalis and diuretics. Of the value of complete rest there can be no doubt, though Levine reminds us that in some patients, particularly elderly ones or those with primary left ventricular failure, rest in bed may aggravate rather than alleviate the condition. For this well-recognised state of affairs in which the heart is embarrassed by the increased return of blood to its right side, the cardiac bed, the top third of which can be raised and the bottom third lowered, is preferable to the old-fashioned combination of a comfortable chair and a table on which to lean. Digitalis is still our stand-by in all forms of congestive heart failure, whether with auricular fibrillation or normal rhythm,[8] and the main advances have been in the reliability of the various preparations of digitalis on the market, and in the recognition of the need for adequate dosage, though the massive dosage popularised in America by Eggleston[9] has not been widely accepted here. Expensive proprietary preparations are no longer required in the ordinary case, and Evans[10] has demonstrated that the powdered leaf is the best and also the cheapest form of digitalis for maintaining equable digitalisation. The work of Fraenkel and his colleagues[11] on the value of strophanthin has, for some reason, not received due attention in this country; despite Lewis's[12] teaching, there is something to be said for the intravenous administration of strophanthin in doses of gr. 1/100 in the few cases where immediate control of the ventricular rate is required. Quinidine sulphate by the intravenous route has also proved its value in cases of paroxysmal ventricular tachycardia when all other measures[9] have been tried and the heart is failing; and acetyl-β-methylcholine has established itself in the treatment of paroxysmal supraventricular tachycardia.[13]

The question of which diuretic to use in congestive failure has now been definitely settled; the organic mercurial diuretics have proved superior to all others. Indeed, in adequate dosage—2 c.cm. intravenously every third or fourth day—they have almost done away with the need for mechanical removal of œdema fluid; certainly Southey's tubes may be relegated to the museum, and there are few cases of hydrothorax which will not respond to these drugs. In ambulant patients who have shown clinical evidence of cardiac œdema and received the appropriate treatment, they often prevent, or at least postpone, a recurrence. Bleeding is now rarely needed

4. de Ligneris, M. J. A. *Ibid*, p. 489. 5. Hieger, I. *Ibid*, p. 496. 6. *J. Amer. med. Ass.* 1940, **115**, 1715.

7. Kinsey, D. and White, P. D. *Arch. intern. Med.* 1940, **65**, 163.
8. Gavey, C. J. and Parkinson, J. *Brit. Heart J.* 1939, **1**, 27.
9. Eggleston, C. *Arch. intern. Med.* 1915, **16**, 1; *J. Amer. med. Ass.* 1920, **74**, 733.
10. Evans, W. *Brit. Heart J.* 1939, **2**, 51.
11. Fraenkel, A. *Lancet*, 1935, **2**, 1101.
12. Lewis, T. Diseases of the Heart, London, 1937, p. 89.
13. Ebert, R. V. and Stead, E. A., Jun. *J. clin. Invest.* 1940, **19**, 561.

except in a few cases of left ventricular failure, and Ebert and Stead's [13] observation that as much blood is removed from the general circulation by a venous tourniquet on the limbs as by the usual phlebotomy should tend to diminish still further the need for this traditional line of therapy. The introduction of the B.L.B. mask, whereby oxygen at concentrations up to 100% can be given for long periods, has called for a revision of opinion on oxygen therapy in heart-failure, particularly in view of the successful results obtained in coronary thrombosis. Finally, the problem of the best diet for patients with congestive failure has been at least partially solved by insisting on as little restriction as possible. The Karell diet has received a new lease of life. In view of the hypo-proteinæmia present in certain cases of congestive heart-failure the patient's diet should contain as large a proportion of protein as his digestive tract can cope with; whether the Karell diet of 800 c.cm. of milk daily meets these requirements is doubtful. There is now general agreement that salts and fluids should be restricted, though not to the pitch of causing discomfort to the patient.

RESPIRATION IN THE NEWBORN

Bauer,[1] of Detroit, has made a useful mechanical study of some of the questions about respiration in the newborn which remain unsolved. He felt that it was desirable to have a more definite picture of the relative functions of the diaphragm and chest wall in normal respiration, particularly because such understanding will help in the safe employment of any mechanical means to initiate or improve respiration in the newborn baby. The apparatus Bauer used consisted of two cloth-enclosed rubber tubes ("cigarette drains") similar to the cuff of a sphygmomanometer, one encircling the abdomen just above the umbilicus and the other the chest at the nipple line. Each was attached to a recording tambour by small rubber tubing. A third pen recorded time in seconds. After the tubes had been applied, the baby was placed in his crib, covered and allowed to go to sleep. The tubes were then gently inflated—the degree of pressure did not appear to affect the results—and the recording started. Nineteen healthy infants were studied, ranging from 1 to 10 days in age and 6 to 9 lb. in weight. Most of the tracings lasted over a period of 5–10 minutes and fortunately in most instances the babies remained asleep, some soundly, some lightly. The rates of breathing were higher and much more varied than has hitherto been described. The slowest average rate was 28 per min. in a completely quiet infant and the highest 120 in an infant who was crying, but a maximum rate of this degree was also found in a quiet infant and in another with hiccups. The average for all the observations was about 60 per min. It was found that the amplitude of the abdominal movement was from two to five times as great as that of the chest. At least two types of related movement were found in all the babies. In one the chest expanded slightly with expansion of the abdomen and in the other there was a retraction of the chest just before full expansion of the abdomen. Bauer explains these observations on the basis that when breathing is rapid and shallow the chest expands with the abdomen—i.e., with diaphragmatic descent—but when breathing is slower and deeper the more forceful pull of the diaphragm produces retraction of the relatively weak, elastic chest wall. These observations throw some light on the ætiology of atelectasis, at any rate in a negative way. Weakness of the chest wall has been considered a possible factor in non-expansion of the lungs, but Bauer found such weakness in some degree in all these healthy babies, suggesting that cohesion of moist alveolar walls and bronchial obstruction are more likely factors. Another point which he makes is that there should be no mechanical interference with respiratory movement, unless it has never started or has stopped completely, because it is unlikely that any apparatus for artificial respiration could be regulated to follow the great variations in rate and type which are present in the newborn. He suggests that some means of holding the chest in a position of full expansion for short intervals might help by eliminating the retraction caused by the pull of the diaphragm in laboured breathing. Bauer's records show that crying causes the greatest degree of expansion of the chest and abdomen, and, intelligently used so as not to cause trauma or make things worse for a severely asphyxiated baby, the production of a "lusty cry" still remains justifiably popular as a means of starting off or deepening early respiratory effort.

1. Bauer, A. R. *Amer. J. Dis. Child.* 1940, **60**, 1342.

IMMUNISATION AGAINST SCARLET FEVER BY MOUTH

VARIOUS reasons can be given why immunisation against scarlet fever is not at present a practicable—or even necessary—procedure. The repeated injections of toxin with a fair proportion of both local and constitutional reactions, the mildness of scarlet fever, and the fact that immunisation against the erythrogenic toxin does not protect the individual to any degree against the streptococcus itself have together prevented a wide usage of this prophylactic measure. Yet, immunisation against scarlet fever may from an administrative viewpoint be desirable in certain circumstances—e.g., among nurses in fever hospitals, children in residential schools, and in institutions where an epidemic of the disease has lately occurred. To overcome the difficulties associated with the ordinary method of shallow hypodermic injection of the toxin in graduated doses over a period of five to six weeks, the Dicks [1] have been exploring the possibilities of immunisation by the mouth. Obviously the liquid toxin could not easily be distributed in large quantities for oral administration, so they prepared a purified toxin in powder form, which, given either in saccharose or in syrup, caused a considerable amount of nausea and vomiting, as might be expected in view of the known affinity of scarlatinal toxin for the gastric mucosa. Enteric-coated tablets were therefore prepared and used with success, although some failures resulted either from the coating being dissolved in the stomach, causing gastric upset, or from its being undissolved because of rapid passage through the gut. The optimum dosage is 75 million skin-test doses given once daily after a meal for three weeks in gradually increasing amounts from 100,000 S.T.D. to 6–10 million S.T.D. on each of the last few days. Of 102 people who received amounts of toxin ranging from 47 to 91 million S.T.D. over a period of two to three weeks, 94·7% were immune on retest. In 4 of these cases, transient scarlatinal rashes appeared, usually after the 4 million dose; 2 people vomited once. The advantages of the oral route seem to be in the shorter period of immunisation and the avoidance of local reactions; it will be particularly valuable for people who are allergic to foreign protein.

1. Dick, G. F. and Dick, G. H. *J. Amer. med. Ass.* 1940, **115**, 2155.

Sir JOHN MCFADYEAN, formerly principal of the Royal Veterinary College, died on Feb. 1 at Hindhead in his 88th year.

Prof. A. H. BURGESS will deliver the Hunterian Oration before the Royal College of Surgeons of England on Feb. 13 at 2.30 P.M. His subject will be Charles White of Manchester and he will speak at 1, Wimpole Street, W.1.

Special Articles

FUTURE OF CLINICAL PATHOLOGY

ITS PLACE IN A SOCIALISED MEDICAL SERVICE

By D. Stark Murray, M.B., B.Sc. Glasg.
PATHOLOGIST TO THE ROYAL HOSPITAL, RICHMOND

Clinical pathology advanced with great rapidity as a result of the last world war and there are indications that it may receive another impetus from the present one. No branch of pathology is static and those concerned with detection of disease and departures from normal are still in the stage of development which may lead to greater diagnostic accuracy. The rapidity of that development will depend to some extent on the attitude of the profession as a whole not only to clinical pathology but to the prevention of disease.

RELATION OF CLINICAL PATHOLOGY TO MEDICINE

The attitude of the medical profession to clinical pathology and the clinical pathologist cannot be said to have reached finality. There are still those who regard the clinical laboratory as a place from which, under orders, results confirming the physician's diagnosis may be forthcoming. There are, however, others who would agree with Goodhart [1] that "pathology is and must remain the rock on which the house of medicine is built." Goodhart realises that successful medicine is only possible when there is "coöperation between ward and laboratory, but the coöperation must be a real one between equal partners." Such a partnership will only be possible when the relation of clinical pathology to other fields of medicine has been defined and accepted. At the moment the clinical pathologist may be described as one who is skilled in the technological procedures valuable in the diagnosis of disease or the control of treatment, and practised in the interpretation of these procedures. He may perform tests which provide answers nearing that mathematical accuracy which earns the name of science; and his interpretation of ascertained facts may need to be as delicate as that which the physician brings to bear on the sounds he hears with his stethoscope. In this interpretation the clinical pathologist must leave the laboratory and relate his findings to the patient; and in so far as he realises that individual reactions must be taken into consideration so will his coöperation with the physician or surgeon benefit the patient. He will work to the best advantage, of course, in those cases where he is given a free hand and can carry out his tests in the order and at the time most likely, in his experience, to yield results.

Goodhart fears that we "are breeding a race of pathologists who regard contact with human beings as a contaminating influence." Medical science needs every type of worker, but the greatest need will always be for those whom Zinsser [2] describes as "coördinators prepared to bring the laboratory to the wards and the wards to the laboratory." We shall make a serious mistake if we think of clinical pathology as a service provided only in large hospitals. Dyke [3] appears to do so and is thereby led, in my opinion, into the error of expressing himself as though clinical pathology meant hospital pathology with a little "private practice." If clinical pathology is essential to those working in fully equipped hospitals, how much more necessary is it to general practitioners who must deal with disease on their own initiative? Much has been written about improving the status and standard of general practitioners and it is undoubtedly true that their association with the hospital service, as suggested in a recent pamphlet,[4] would produce the improvement. One factor in that process would be the opportunity to use that most valuable of tools, clinical pathology. That tool should, however, be available to every practitioner in his ordinary practice. It would be of great value to the doctor, to the sick who desire rapid diagnosis, and to the community, which wants early detection of disease. The clinical pathologist, too, has much to gain by association with the work of the disease-prevention agencies and with the general practitioner. Pathologists who are only enraptured by the rare or intricate cases often complain that they are asked to do too many tests that produce only normal results. Yet it is only by a sufficiently large background of these averages which we call normal that the finer reactions to disease may be gauged. Such a background would be provided by work in the homes of the people and in clinics and surgeries, and the benefit to the community that would arise from new methods of detecting minor changes would be equalled by the advance in clinical pathology that this work would ensure.

The association of the laboratory with the civil population would have further implications. The clinical pathologist cannot work with the general practitioner and the disease-prevention services without being required to take part in epidemiological bacteriology. There is, of course, much work to be done by experts in this subject and large-scale investigations are for the specialist; but the clinical pathologist is concerned with everything which affects the patients of the doctors with whom he works. He must therefore be viewed as one part of the team which serves a community and not as a man who confines himself to a particular set of problems. If he is well trained he will know when he requires the help of experts in one branch or another. Closer relation with the bacteriologist engaged in whole-time study of infectious disease will benefit all laboratory workers. The primary detection of diseases such as diphtheria and typhoid is rarely the work of the bacteriologist. Diphtheria comes under the care of the general practitioner, typhoid is often admitted to a general hospital. In both cases the pathologist has to make or confirm the diagnosis, and his laboratory must be conveniently situated. Where many laboratory examinations are needed it is obviously preferable that they should be carried out by one staff and interpreted by one expert. The community served by a laboratory must therefore be of a size to require a laboratory large enough to carry out routine procedures at an economic cost, and small enough for the staff to be familiar with all the work passing through it. This question of laboratory size introduces a different conception from that of Dyke although one would agree with him that all hospitals over a certain size must have a trained pathologist.

In these circumstances the clinical pathologist becomes one of the most valuable liaison officers between the different parts of the medical services. This is no theoretical suggestion but one which has worked out, in a variety of ways according to local conditions, in various parts of the country. I have experience of an area in which it has worked for many years. Now, under the Emergency Pathological Service (E.P.S.), the laboratory concerned does the clinical pathology for one large hospital, three cottage hospitals, and an isolation hospital, for the five boroughs which these hospitals serve, a large barracks and for over a hundred practitioners in these districts. It follows that no case of meningococcal meningitis or typhoid, for example, occurs in the district without the laboratory staff knowing about it and being able to follow it up at every stage from the first visit by the G.P. to its removal to hospital and on to convalescence. The laboratory is constantly consulted by practitioners, medical officers and hospital staffs about individual cases and about outbreaks of infections, and is often in a position to give information more rapidly than it could be obtained by any other method. For the laboratory staff itself it is invaluable to be able to follow up every type of case, to discuss treatment—and in modern serological and chemotherapeutic methods the clinical pathologist plays an important rôle—and to correlate findings about different patients as they move from one medical sphere to another. Patients do not always remain under the care of one doctor, but though, in the area under discussion, patients may change their personal or even hospital doctor they do not change their pathologist; and this has valuable and occasionally amusing results.

1. Goodhart, G. W. *Lancet*, 1940, **2**, 737.
2. Zinsser, H. As I Remember Him, London, 1940.
3. Dyke, S. C. *Lancet*, 1940, **1**, 86.
4. Medicine Tomorrow, Socialist Medical Association, 1940.

ECONOMIC FACTORS

It has long been recognised that expansion of laboratories is made much easier when they have some method of "boosting" their incomes. Laboratories are not an expensive item in a hospital budget, and even at such low rates as that now charged in the E.P.S. may show a profit on paper; yet hospital committees still appear to expect laboratories to find some way of paying their cost. So long as a fee system remains, the best method is that of associating the laboratory with public-health authorities and general practitioners. Under such conditions the pathologist should be employed on a basis which recognises that he must be free to move from hospital to hospital and to visit patients in their homes. This touches the wider problem of organisation of the medical services as a whole, for a laboratory service cannot be perfectly organised if the rest of medicine remains on its present anachronistic basis. It is true that the present E.P.S. attempts to fit itself to existing conditions, but both in the circular which at present controls it and in the remarks of the ex-Minister of Health to a deputation of the Socialist Medical Association, it is conceded that such a service can only be provided as a fully socialised service—that is to say, it is available to every member of the community, whether in hospital or at home, and the provision of the necessary assistance to doctors and patients comes before the question of fees. The scheme also accepts, by its relation to the sector arrangements, the principles of regional organisation and of inclusion of all laboratories in the area.

THE UNIT PLAN

The supreme importance of clinical pathology can only be demonstrated and put into operation as a service when the form of the medical service of the future has been decided. That it must be a fully socialised service will be universally accepted when the profession and the public recognise what such a service would provide. In a fully socialised medical service four cardinal principles would be recognised: completeness, universality, unification and regionalism. These principles would give medicine its first opportunity to reach full scientific stature, enabling the profession to concentrate on health-preservation and disease-prevention, rather than on treatment and palliation; they would provide a service sufficiently flexible to meet all demands on it, even those of major epidemics, and at the same time would give to doctors conditions of work that have even yet not been clearly visualised.

Regionalism must not be confused with that other conception, regionalisation, now the basis of the E.M.S., of the work of the Nuffield Trust and probably of future local government. Regionalisation simply recognises that a more efficient and economical arrangement of services is possible when the country is divided into regions, mostly larger than the traditional boundaries of local authorities. It is inevitable that the control of medical services will follow similar boundaries to those laid down for other services, so that while the Ministry of Health may lay down the national policy for medicine there will be an opportunity for adjustments to local conditions. This will not safeguard true democratic control (true in the sense that each individual will have a chance to influence those services which affect his well-being) nor will it provide a medical service in which the patient can feel confidence unless at the same time regionalism is adopted. Regionalism cannot be fully explained without a consideration of the probable basis of a socialised medical service, but it depends on the same conception as that put forward above for a pathology service—the conception of a unit of population of a size convenient for doctors and patients alike. In the Walton plan [5] a unit of 100,000 has been taken for purposes of illustration, but a close examination of population distribution, transport facilities and social habits is needed before the best size of unit can be decided in each locality. Flexibility is essential, and the opinion of local doctors and patients would help in establishing a series of regional units sufficiently large to be efficient and small enough to satisfy all those demands for personal attention and knowledge which some fear a socialised service might not meet.

In each region there should be a full domiciliary, hospital and specialist service; and all the ancillary services a doctor needs must be available both in the homes of the sick and in clinics provided for the maintenance of health. There are a number of services—research, educational and highly specialised—which would serve more than one regional unit but be just as easily accessible to every patient and doctor. There is of course no double standard of treatment in those diseases for which a specific remedy has been found, and there is no valid reason why a double standard of attention or treatment should continue in any part of medicine. There should be only doctors and patients and both should have every help that science and organisation can give. If the profession is to be welded into one service with interchangeable personnel, with rapid dissemination of new methods and ideas, and with a basic standard below which no part may be allowed to fall, it is essential that there should be unification. The service postulates which would be universal, unified under one authority and so closely related to the needs of the individual through regionalised control that there would never be any danger of it becoming stereotyped or bureaucratic. It would react to the demands of those mainly concerned, the doctors and the sick. The problem, as Zinsser says, "is to find a solution which shall meet the requirements of effective scientific care of all those who require it, and at the same time that sense of personal responsibility, compassion, and judgment without which the physician becomes a mere technician." This problem can be solved for clinical pathology by the type of service described.

5. *Medicine Today and Tomorrow.* March, 1939.

Public Health

From the Annual Reports

HAMPSTEAD

From Dr. H. Leslie Oldershaw's report of the metropolitan borough of Hampstead we learn that in 1939 in a population of 90,000 there were no deaths from measles and only one from whooping-cough, and in 980 births only one maternal death. There were 39 deaths from pulmonary tuberculosis, 38 from pneumonia and 39 from violence other than suicide. For some years these three causes of death have been competing for first place in the death table after cancer and the senile group of diseases. Violence is winning. Though in theory fatal violence is the most preventable of all means of death, in practice it is not preventable, for with the exception of suicide, homicide and execution, all violent deaths are accidental, that is, due to failure of prevention through human error. They do, however, admit of some limitation by medical means, for accident proneness is an entity sometimes due to physical or psychological states which can be diagnosed.

LEYTON

In his report for Leyton Dr. Andrew W. Forrest gives an account of the establishments for massage and special treatment. In April, 1934, Leyton corporation took over the powers and duties of the Essex County Council Act of 1933 in regard to licensing these establishments and made by-laws for the conduct of the business. These by-laws are concerned with the respectable management of the establishments, but, as Dr. Forrest emphasises, do not prescribe the technical qualifications of the persons administering treatment, and he recommends that in future licences be granted only to persons possessing technical qualifications recognised and approved by the Board of Registration of Medical Auxiliaries. We presume the Essex County Council Act conveys power to make the appropriate by-laws.

PLYMOUTH

Immunisation against diphtheria has been practised in Plymouth since 1927. In the last five years the numbers of children who completed the course of injections were 2118, 1766, 1535, 1137, and 1183. The number of births in the city last year were 3446. There would be about 42,000 children under thirteen years of

age in the city, of whom about 13,000 would be artificially protected. In 1939 there were 404 notifications of diphtheria, of which 22 were in children who had been inoculated. In 4 of these the diagnosis was not confirmed and in 4 others inoculation had been performed elsewhere than by the public-health department. Of the total of 13,258 children known to have been protected 128 have been notified for diphtheria since 1927, the diagnosis being confirmed in 67 and rejected in 61. The incidence of diphtheria amongst protected children under thirteen was therefore 1 in 200, which is less than a tenth of the expected incidence. This confirms the claim made for immunisation that it reduces the incidence by nine-tenths and abolishes fatality. All available information, which is now immense, justifies this claim.

NEWPORT, MON.

Dr. H. W. Catto's report for Newport is fully comprehensive. As in other parts of Britain, the health of this county borough in 1939 was a record for goodness, but there was one unsatisfactory feature in the maternal mortality-rate of 6·7 per 1000 births live and still. In the two preceding years the rates had been 1·27 and 3·18 and in former years the rates had not been high. Two of the ten maternal deaths were due to sepsis, an average number for the town, but both followed miscarriage. We are not told the duration of the pregnancies —whether the products were abortions or stillbirths— but the occurrence demonstrates the confusion in estimating the maternal mortalities of English districts. The Puerperal Pyrexia Order, now incorporated in the Public Health Act of 1936, leaves it uncertain whether pyrexias following abortion are, or are not, notifiable and consequently whether deaths accruing from it should, or should not, be reckoned in casting the puerperal mortality. The word used in the law is not abortion but miscarriage, which is not defined and in practice is used loosely, by some as synonymous with abortion, by others with premature delivery, by others to cover both.

In 1832 Newport covered 938 acres and had a population of 7062; in 1936 its area had grown by encroachment to 7873 acres and its population, mainly by natural increase, to 97,500. Between 1904 and 1939 its birth-rate fell from 32·48 to 15·46 and its death-rate from 15·63 to 12·87, the present tendency being for the former to fall still further and the latter to rise slightly. The infantile mortality varied very little from 1877 (167·2) to 1904 (153·9) but was halved by 1934 and in 1939 scored the low level of 53·6. This reduction to a third of what it was 30 years ago goes but a very slight way to counteract the fall in the birth-rate; and the fall in the general death-rate, which is comparatively slight and, now being reversed, has not done much more to maintain the population level, for though it is still growing in numbers it is ageing rapidly. The stillbirth-rate in Newport was high, 46·3 per 1000 total births, or 0·76 per 1000 population, against the average of 0·59 for the 126 great towns. Dr. Catto says that the results of the compulsory registration of stillbirths reveal that the records for the years before registration are fairly reliable. In Newport the stillbirth-rate, after falling for several years, is again rising. It is curious how this rate varies from year to year and from place to place. The rate should fall steadily with the improvement of midwifery, but it has not done so with the regularity we expected. In 1900 the percentage of total deaths occurring in persons under 5 years was 45·2 and in those over 65 years 15·6. In 1939 the former had shrunk to 8·16 and the latter risen to 51 3 This record, though not exceptional, is a remarkable testimony to the advances made in the present century.

GILLINGHAM, KENT

In the borough of Gillingham, of which Dr. W. A. Muir is M.O.H., the infant mortality in 1939 was 32 and the stillbirth-rate 29. There were 34 illegitimate pregnancies running to viability of which three ended in stillbirth and 31 in livebirths with no infantile mortality. These numbers are too small to have much significance, but the record is interesting in showing the combination of a low infantile mortality with a low stillbirth-rate in legitimate and a low infantile mortality with a high stillbirth-rate in illegitimates. These two combinations were frequent in 1939. Neonatal death is in the main of similar causation as prenatal death and therefore the rise and fall of the one should vary inversely with the other; but death during delivery is preventable by skilled midwifery, so improvement in midwifery does to some extent reduce the total of the two divisions. Good midwifery may ensure the live birth of an infant incapable of survival—such as an anencephale—which is of no value from the infant's point of view, but is of considerable value to the mother, for it means a less severe or prolonged labour. The decrease in the post-natal mortality of illegitimates is a recent gain of great value, b the prenatal mortality of illegitimates is still compara..vely high. The explanation is that owing to the compulsory notification of births the born infant can be brought under supervision, whereas pregnancy not being notifiable unmarried mothers usually escape supervision. Out of a total of 32 infant deaths, 22 were due to congenital debility, prematurity and malformations.

In the twelve years 1928–39 the attack-rate of diphtheria varied from 0·13 in 1932 to 4·4 in 1938, the average being 1·26. In the ten preceding years it was 1·24. Though the annual incidence of diphtheria fluctuates widely, the average has remained unaltered for a great many years, not only in Gillingham but in most districts of Britain. In America the incidence has been falling since Osler's time, and since the introduction of inoculation it has sunk extremely rapidly. We can expect a similar result from inoculation in Britain.

LEAMINGTON SPA

Dr. E. R. Gilmore, of the borough of Royal Leamington Spa, records a zymotic death-rate of nil, an infantile mortality of 31·3, a tuberculosis mortality of 0·54 per 1000 population and the average age of death as 65 years. Of 411 births, 16 were illegitimate; 4 of these died, giving an infantile mortality of 250. Amongst the legitimate infants the mortality was 21·6, astonishingly low for a town of 30,000 inhabitants; the stillbirth-rate was 19·5 per 1000 total births, which is also remarkably low. People certainly live long in Leamington, for of 412 who passed away in 1939 only 152 failed to reach 65 and the same number scored 75 or more. The birth-rate in 1939 was 13·4, the highest since 1930. The average birth-rate for the past thirty years was 14·8 and the average death-rate for th: same period 14·8 also. The av.rage infantile-mortality rate for the period was 60·2. It did not fall much before 1932, but in 1934 it was only 8·9, which surely must be a record. However, the average of the three years 1933–35 was 33·4, so the record was "accidental."

Infectious Disease in England and Wales

WEEK ENDED JAN. 11

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1164; whooping-cough, 2761; diphtheria, 1233; enteric fever, 30; measles (excluding rubella), 15,413; pneumonia (primary or influenzal), 1465; puerperal pyrexia, 119; cerebrospinal fever, 266; poliomyelitis, 5; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 93; ophthalmia neonatorum, 73. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Jan. 17 was 2321, including: scarlet fever, 325; diphtheria, 343; measles, 902; whooping-cough, 149; enteritis, 23; chicken-pox, 216; erysipelas, 50; mumps, 25; poliomyelitis, 2; dysentery, 53; cerebrospinal fever, 46; puerperal sepsis, 6; enteric fevers, 7; german measles, 4; other diseases (non-infectious), 91; not yet diagnosed, 88.

Deaths.—In 126 great towns there was no death from smallpox or enteric fever, 1 (0) from scarlet fever, 22 (2) from whooping-cough, 23 (1) from measles, 43 (3) from diphtheria, 36 (4) from diarrhœa and enteritis under 2 years, and 69 (9) from influenza. The figures in parentheses are those for London itself.

There were 6 deaths from diphtheria in Liverpool. Birmingham reported 7 fatal cases of whooping-cough. Greater London had 1 fatal case of enteric fever.

The number of stillbirths notified during the week was 217 (corresponding to a rate of 38 per thousand total births), including 13 in London.

In England Now

A Running Commentary by Peripatetic Correspondents

YESTERDAY I went to the Abbey for the memorial service to B-P, not an uncheerful occasion. No-one in our time has given as much happiness and health as this, lovable boy-man, for not only has he inspired all those vast numbers who have been or are scouts or guides, but multitudes beyond, the week-end campers, that host of lads and lasses in shorts who bike or hike along country roads all over the world, a noble army of those who seek health in service. Whatever form of immortality awaits us lesser folk, whether it be merely that we are transmuted to the wood and leaf of the churchyard elms, or flung to the four winds in gaseous form from the necropolis chimney, or sprout wings, or play on golden harps, this is certain, that for generations to come, whenever youngsters gather round a camp-fire, whenever the call of spring and adventure takes them into the wilds, whenever the joys of service summon them, B-P will be with them, sharing in their zest.

* * *

After half a lifetime spent in the laboratory in unusually complete detachment from clinical medicine, I am finding a "war-emergency" return to the bedside absorbing. Stout Cortez was not as stirred as I when I recently watched the meningococci in a daily smear become sparse even unto extinction under attack by sulphapyridine while the patient miraculously recovered; or a pernicious anæmia, thirty years ago to be labelled doomed, now burgeoning reticulocytes after a few injections of liver extract. Rip Van Winkle could not have had the thrill of returning to anæsthesia, and, instead of half-narcotising himself daily with a too generous ether or chloroform fog, toying with the admirably efficient and almost foolproof gadgets of a late-pattern MacKesson. And what a boon are premedication or anæsthesia with the barbiturates, and chemotherapy in pneumonia; and to help while a pulseless dying bombtorn victim is being plucked back by the wizardry of plasma transfusion, or a marble-white hæmatemesis grows rosy pink, is an experience to have lived for. But alas I see that patients still die from ileus and exhaustion in the time-honoured manner. General surgery does not seem to have moved much, and am I pernickety in blinking when the physician still visits his patient in uncovered outdoor garments and sans mask? As for minor horrors, my recent boil in a hardly respectable locus still bred its family of baby boils in the authentic tradition, despite the wheedling of mag. sulph. paste.

* * *

Near one of the City's most famous landmarks may be heard the sound of picks and shovels, the rattle of pneumatic drills and the hissing of oxy-acetylene burners cutting through twisted girders and battered steel plates. A vast crater teems with Pioneers breaking up masses of concrete, which are hauled up by big cranes. It was the custom of the shelterers at this underground station to deposit their bundles down on the platforms and in the deep corridors, and then to come up to the booking-hall, just below street-level, where they found a well-lighted balcony with shops all round. This was their Brighton pier, and for an hour or two before retiring for the night they were in the habit of promenading round, leaning over the railings, watching the escalators (on which children used to play) and gossiping with their friends. It was Saturday evening, and the Shelterers' Parade was in full swing. It is true that the sirens had sounded, but that was a long while ago, and no bombs had been dropped anywhere within earshot. Not even a gun had been fired for about twenty minutes. A policeman on point-duty overhead must have been almost the first to realise that danger had suddenly become imminent: he heard the familiar sound "as of a rushing mighty wind" and he ran for his life to the nearest cover. He was only just in time; next moment the city was shaken by a deep roar—a large bomb had fallen into the booking-hall and blown the roof off. Concrete was hurled into the air, the blast travelled down the wide escalator shaft and through the open doorways, sweeping all before it, throwing people off their feet—many fell on to the line, of whom two, a soldier and a policeman, were thrown in front of a train which was just entering the station. Help for the victims was not long in arriving. A mobile unit from the City corporation was soon on the scene, and even before this, a few yards from the crater, a dressing-station was set up in a surface-shelter in which two nurses attended to people who had been caught in the street. A man lay on his back in the roadway, crying softly to himself, "Oh, my belly! Oh, my belly!" He had a ragged tear across the upper abdomen, his clothes were torn half off and his face so blackened with road dirt that he looked like a negro. It was the work of but a moment to apply a sterile triangular bandage to the whole abdomen, pull his tattered shirt and waistcoat down over it and adjust his wide leather belt to hold the dressing in place. A Tubunic ampoule of Omnopon was injected into the abdominal wall—both his arms were as black as his face. Already a stretcher-party had arrived, and he was taken off to hospital. Against the wall of a near-by building the police had propped up a row of casualties—a fractured forearm, a girl with a gash down the side of the face, a man with the top of his head knocked in (no pulse; blood-stained froth on his lips; quick, jerky inspiration followed by slow, bubbling expiration, probably due to hæmorrhage into the lungs—a common effect of exposure to blast at short range). As soon as these cases had been dressed we turned to explore the booking-hall and its approaches.

Walking warily—for the street was littered with debris, and wide cracks had appeared in the paving, manhole covers were missing, and the asphalt hung perilously over the edge of the crater—we entered one of the stairways leading down to the station. About ten people were lying on the stairs, one had all his clothes torn off, another had a leg missing, severed at the knee, all were black with grime and every one was dead. Halfway along the corridor our torches showed someone moving his arms; it was difficult to reach him, for the passage was almost choked with masses of concrete and twisted steelwork. Also, there was a strong odour of coal-gas; a moment later this caught fire, but was soon extinguished. He was trapped by his legs under a huge slab of reinforced concrete but already the rescue-party was getting to work with jacks and levers, he was given an injection of omnopon (tubunic, of course—it was no place to try to fill a syringe). It took an hour to get him out; in the meantime he was made as comfortable as possible, with his head pillowed on the legs of a dead man just in front of him. A woman's handbag lay on the floor; we peered into every dark crevice under the debris to find the owner, but there was no sign of her. Either she or the handbag might have been blown a long way. We went down by the emergency stairs to find that a large number of people had been injured below ground. When a bomb explodes in such a confined space as this distance is of less importance than the width of the passages, and they happened to be exceptionally wide in this station. The first necessity was a bucket of water and a large swab; even here the wounded were covered from head to foot with dirt. It was impossible to do more than a hasty toilet, then apply those handy "mine dressings," each in a sealed paper covering, and with an adequate length of bandage attached; there are three sizes, and a small haversack will hold half a dozen small, a dozen medium and half a dozen large. These, with a dozen sterile triangular bandages, also in sealed paper envelopes, a soft rubber tourniquet and three boxes of tubunics, provided all the outfit required for attending to some thirty or so of the casualties. The highest praise is due to the station staff, who brought water, stretchers and tea to the improvised dressing-station, and operated a lift to the waiting ambulances. In just an hour and a quarter the last of the injured was on his way to hospital. But there was one case more; twenty hours later they found the booking-clerk, still alive, but terribly injured; he had been trapped in a corner of the entrance hall. Hammers are swinging, the cranes whistle and clang, Pioneers sweat and tug at the chunks of concrete and tangled steelwork, already the site has been largely cleared and spanned by a temporary bridge, for city traffic must pass, and under and around the bridge the engineers will set to work to rebuild the upper part of the station. Tonight the shelterers are huddled along the platforms and deep corridors, there is no more Brighton pier for them. Even their accustomed

corners are sometimes no longer available, for there was much damage below ground, and water is leaking into the station at many points, but repair work goes on night and day, and there was hardly any interruption of the running of the trains.

* * *

A friend of mine is in charge of a large camp for prisoners. He tells me that one of the most remarkable things about the feeding of the men is the small amount of swill the Germans make—they waste about a third of what our men do, and they render down every bit of fat available. Mr. J. B. Priestley has told us to look forward to communal restaurants as social centres, and we may imagine other advantages in them, too. Another friend of mine, a well-known caterer, tells me that the by-products alone will make them worth while. Breadcrumbs, potato peelings and cheese rind are all valuable by-products but meat, he says, yields more useful things than any other article of food, and they can be extracted from it to best advantage in a communal kitchen. If 5000 people are allowed 4 oz. of beef per head and carry it home to cook, a joint of 1 lb. will serve four people and a joint of 6 lb. twenty-four; but housewives will agree, he tells me, that from the 1 lb. joint nothing will be left, and from the 6 lb. joint there might be enough bones to make soup for five of the family, and enough dripping for four of them to have bread and dripping for tea. And what would happen to the bones of the carcass? Did 10% of them—for they are valuable—find their way to the contractor? And did the butcher boil the large bones before he sent them to the contractor? He should have done, for the contractor finds them just as useful to him cooked as raw, and the remains of meat upon them would have made rich stock. Suppose the same amount of meat—1250 lb.—had been issued to 5000 communal feeders. There would be roughly, I was astonished to learn, three forequarters and four hindquarters of meat in this allowance. After giving everyone roast beef for their midday meal, from the bones of the seven quarter carcasses, it will be possible to give 3000 people a really good soup in the evening. From the skimmings from the top of the stock-pots, when the bones are boiling to make this soup, it will be easy to extract enough fat to give everyone half a slice of fried bread the following morning. Fat taken from the carcasses before the joints were cut up and put in the roasting ovens will yield enough dripping to give everyone enough for a good spread on bread for tea. And 95% of the bones will have gone to the contractor. The dripping made from the fat cut from a carcass before it has been boiled or roasted is called in the Army first-class fat and that from the skimmings of bones being boiled for soup, second-class fat. My catering friend does not approve of these descriptions because the fat or dripping called second-class is far more palatable than that called first-class. The balance in favour of communal feeding as far as meat goes—and, as I now realise, it goes a long, long way—is tremendous, and he assures me that other foods are saved in the same proportions. Yes, communal feeding should be here for the duration.

* * *

If at times I get discouraged I go and talk either to workmen or antique dealers. It sounds an odd combination but the reasons for my choice will appear later. A few weeks ago I was asking a lad of seventeen about the hours and conditions of his work. He forges parts of aeroplane engines for 12 hours at a stretch and works by day one week and by night the next. "Do you feel very tired after your 12-hour shift?" I asked. "Yes, just a bit," he replied. "Only a bit? Do you really feel that you could go on after 12 hours of it?" "Of course, sir, after all we've got to win the war haven't we?" I could not resist patting his sturdy shoulder with a "that's the stuff to give 'em." And all the lads I spoke to had the same spirit. Not being a Southron I feel all the more entitled to praise these gallant English boys. There is nothing decadent about them, nor are they dull clods or blind mouths, as Milton has it. They are highly intelligent and are made of the same stuff as the Elizabethan adventurers. In some ways I imagine that they are even better than the Elizabethans, because there was probably more romance in sailing the Spanish main than in working in a steel factory—though the factory has a grimly romantic atmosphere all its own.

I daresay that others besides myself have noticed that antique dealers as a class are charming people. They are probably drawn to antiques because they are sensitive to the beauty of line and mass and colour of the things made by craftsmen, and most of them are passionately in love with their wares. Sensitiveness to beauty does not necessarily go with charm of manner and friendliness, but the fact remains that in antique dealers it usually does. A grocer would not as a rule welcome anybody into his shop to discuss the æsthetic qualities of his rows of tinned conserves, and it would be a brave customer who would do so and then leave the shop without a sample of one of the 57 varieties. But I often go into an antique dealer's shop and see and discuss things worth looking at and leave without buying one. True, I have not always gone into these honey pots and escaped without things sticking to me; and I do not regret the adhesion of such things as an oil painting by Etty, a water-colour by C. J. Fox, a dainty imperial yellow porcelain bowl of the K'ang Hsi period or some old English wine glasses. Some things the dealers will not let go. They like them too much. One of my antique dealer friends has a beautiful old mirror in his sitting-room and nothing will induce him to part with it. Several times have I sat in one of his Chippendale chairs and admired it silently and vocally. But the other day when I was making a nuisance of myself again about it he said, "I don't think you have any specimens of Chelsea china in your collection. Here is a lovely little piece which I've kept for you. You'll notice the smoothness and peculiar excellence of the glaze and how delicately the exotic bird has been painted." When I asked about the price he indicated rather shyly that it was a gift. His delicate gesture delighted me and I felt as if I had a collection of Chelsea china as magnificent and complete as that of Dr. Bellamy Gardner. Incidentally I forgot all about the mirror and the exigencies of the war.

* * *

The effect of disease supervening on existing disease must have been noted and aroused curiosity from time immemorial. It is a subject historically best suited to the patient, thorough, critical compiler, such as one finds among Germans. It can hardly have escaped the attention of some historically minded investigator, but if there is some work on it I have not seen it. There is also the problem of the mode of action of one disease on another, which could only have been investigated in recent times, involving as it does immunological and chemical research. It is as worthy of a thesis as a good many subjects and would require more historical research than individual experience on the part of a candidate. The experience, I think, lies locked up, with much else of interest, mainly in the memories of general practitioners. Herpes on the lips and elsewhere in pneumonia is said, according to Fagge's "Medicine" (1888), to occur in from two-fifths to one-half of all cases; and he remarks that it is very strange that it is far more common in cases that do well than in those that end fatally. He adds that this has long been a traditional opinion, and that it seems to have been established by the observations of Geissler (1861), who found that of 421 cases the mortality amongst those with no herpes was 29·3%, compared with 9·3% in those who had it. Naegeli (*Münch. med. Wschr.* 1936, 83, 339) also speaks of the belief of experienced practitioners about the favourable influence of herpes simplex on other diseases, especially pneumonia, and confirms Fagge's quotation concerning the mortality-rate. Why this influence? A further curious statement that I have seen is that the success of fever therapy in neuro-lues is most frequent and most pronounced in herpetics, especially in patients in whom a considerable eruption appears during the cure. In some cases neuro-lues was favourably influenced by herpes-inoculation and subsequent activation with fever when a previous fever-cure had been ineffective. This statement should be verified, especially when diathermy or short-wave therapy is used.

A very uncommon instance of the action of malady upon malady is reported from Sofia (cited in *Münch. med. Wschr.* for Oct. 21, 1938). A patient who had had diabetes for nine years developed severe diarrhœa, and was found to have atrophic cirrhosis of the liver. Clinical recovery from the diabetes, or at least marked

improvement is said to have taken place. Although the diet was preponderantly carbohydrate, on account of the cirrhosis, there were no further clinical symptoms of diabetes. This is ascribed to a diminution in the glycogen reserve in the cirrhotic liver, or to a compensatory hypertrophy of the pancreas.

Letters to the Editor

ARTIFICIAL SHORTAGE OF DOCTORS

SIR,—It was high time that this subject should be brought to the notice of our profession and of the general public, and you are to be congratulated on dealing with so grave a matter in so judicial a way. It is possible to sense that but for your responsible position there was more that you wished to say. This fictitious shortage is primarily due to the demands of the Army Medical Service, for the Navy and Air Force seem to have exercised praiseworthy restraint in their demands. As you have indicated in your final paragraph it is essential that the requirements of our overseas and home services be considered separately.

Overseas forces on active service must be provided with adequate medical personnel under military discipline. Are we not entitled to ask if the Army Medical Service is not guilty of extravagance in the number of medical officers it requires for each type of unit? The establishment of these is said to be confidential and one can understand the reluctance of the Army Medical Department to reveal the voracity of its appetite, but in fact the figures are well known as they appear in those textbooks and manuals which assist officers in their promotion examinations. A general hospital of 1200 beds is allotted 34 M.O.s in addition to a quartermaster and three padres—a generous allowance to say the least. Other units are catered for on an equally lavish scale. It is a rigid insistence upon this establishment which is threatening to strip civilian medical reserves at a rate which is heading straight for disaster. It is permissible to ask why nearly all our best young men put their names down for the Navy or Air Force and unwillingly take the Army when told that the other services are full. Among many other reasons is the advice given by friends who joined up earlier: "Whatever else you do, don't join the R.A.M.C.; there are lots of us here and nothing to do."

When we turn to the home front, the extravagance and wastage of personnel could find no better example than that quoted by you—the creation of 12 orthopædic centres in the Army—and yet this is only symptomatic of the whole. Taken by itself, however, it is a cogent reason for pooling our resources in both men and equipment, as one illustration will suggest. Rehabilitation has been a favourite word of late, but only its fringes have been explored by either civilian or military authorities. In the Services when a man is boarded out as unfit he is thrown back into civilian life without ever having been given the benefits of these army centres; such a man with a pittance of a pension and unfit for work becomes a liability and not an asset to the community. Surely this economic futility could be avoided by pooling our resources. Whether a man be in khaki or dark or light blue he is still an individual member of the community and when sick or wounded is entitled to the same care and treatment as the sick or wounded civilian—neither more nor less. Why then in England should he be treated separately? Matters of service discipline and organisation arise when uniformed patients are treated in civilian hospitals but that has already been solved in the E.M.S. hospitals. This pooling of doctors is redolent of State Medicine, and I confess to being apprehensive of recent talk upon this subject, for the times are not conducive to sane and balanced thought upon an indefinite future. But if this pooling of our resources is state medicine then I am well on the way to conversion.

In spite of what you say this is a clash between rival claimants, not for personal but personnel ends, and as more than one great department of state is involved the final court of appeal presumably is the Cabinet. If it wishes to ensure adequate medical attention for every section of the community in the testing times which lie ahead it must move and that right quickly.

Harley Street, W.1. R. M. HANDFIELD-JONES.

THE BLEEDING TOOTH SOCKET

SIR,—Many dental surgeons will regret the opening paragraphs in your annotation of Dec. 28 (p. 814). You appear to imply, although you do not actually say so, that dental hæmorrhage arises through a fault on the part of the dental surgeon, who shirks his responsibility; but this is rarely so. Most dentists are only too willing and anxious to treat their own cases of dental hæmorrhage. It is a well-known fact that the dentist in nearly all cases is better equipped to do so than the doctor, but serious cases do arise where the coöperation of the doctor and the dentist is essential. The patients are responsible for calling in the doctor and they have a perfect right to call in medical aid, particularly if they are panel patients. Medical men do not quibble about attending a wealthy patient in the middle of the night for dental hæmorrhage, and often take the case out of the dentist's hands, but if it is a panel patient, and there is no fee, well—that is where the shoe pinches. The correct procedure is for the doctor to ring up the dentist at his home, and ask him to attend, and then for the dentist to call in the doctor, if necessary. Your statement that hardly any of the cases which give trouble after dental extractions are hæmophiliacs is only partially correct. All hæmophiliacs give trouble after extractions, and the greatest possible precautions have to be taken. The class which gives greatest trouble is the pseudo-hæmophiliac. In true hæmophilia we know the male inherits the condition and the female passes it on; she is not herself a true hæmophiliac, but is often a pseudo-hæmophiliac. Dental hæmorrhage often arises in females because the extractions have been done during, or immediately preceding the onset of the menstrual period. A wise dentist will always make inquiries before proceeding with extractions, particularly multiple extractions, in females.

Hæmorrhage usually takes place from the apex of the socket, and is often caused by the disruption of a dental abscess, or granuloma at the apex of the tooth. To stitch over the gums of a true hæmophiliac is dangerous, because hæmorrhage would immediately take place from the trauma caused by the needle. If the bleeding-point is from the gums around the socket, then the actual cautery is very efficient. Venom of the Russell viper is also very effective for this, but if the hæmorrhage is taking place from the bottom of the socket, as is usually the case, it is almost impossible to apply this to the bleeding-point, since it is washed away by the hæmorrhage. In my opinion, there is only one safe, effective and never-failing remedy, and that is the treatment I discovered accidentally about twenty-five years ago, and have published several times in dental journals. It is this: a hard tampon of cotton-wool, about the size of the root socket, is put into a liquid made up of equal parts of liquor ferri perchlor., liquor hydrarg. perchlor., and glycerin. It is then dipped into tannic-acid powder and pressed firmly into the socket, being kept in situ for a few minutes with the end of the finger, and left in for twenty-four hours. This black pack contains no free perchloride of iron (which invariably causes sloughing and further hæmorrhage), because the perchloride of iron unites with the tannic acid to form a tannate of iron. Tannate of mercury is also formed, and free hydrochloric acid. Anæsthesin (benzocaine) is also invaluable, because it causes a constriction of the walls of the blood-vessels, and this may be added to the tannic acid with advantage.

Patients should not be allowed to rinse the mouth after extractions, not even a single mouthful. Water weakens the clot, causing a wash-leather surface, instead of a hard glazed surface. Mouth-washes for after-treatment are a mistake, particularly hydrogen peroxide or sodium perborate, for these dissolve the blood clot. The gums should be swabbed with a mild antiseptic on cotton-wool. Patients should be instructed not to suck the gums, or poke the sockets with the fingers. Tea should be prohibited. Dental hæmorrhage often commences twenty minutes after taking a cup of tea. For all known or suspected "bleeders" prophylactic treatment should be prescribed: calcium for three days prior to extractions, or injections of hæmoplastin, plus vitamin K. I have for some time done extractions for these patients, when necessary, after swabbing the gums for three or four

minutes with a solution of 3% anæsthesin in olive oil beforehand. It was the use of this method which made me suggest in 1933 that there was another factor in hæmorrhage besides the factor of coagulation of the blood, something akin to a "turning off of the tap" as it were. Hæmorrhage in a good many cases is not due to poor coagulation, but rather to the fact that the ends of the severed blood-vessels fail to close, and it is this factor which is usually present in dental operations.

Sutton Coldfield, Warwick. E. VAUGHAN TOMEY.

B.M.A. MEDICAL PLANNING COMMISSION

SIR,—We have read with interest and appreciation your leading article of Jan. 11 and the letter of Sir Ernest Graham-Little in the following issue. It is a matter of regret and anxiety to many members of the profession that the British Medical Association, which is in reality a club of which membership is still voluntary, should be so widely regarded as representative of the whole profession. Now that this body, which through its war committee was largely responsible for our present emergency service, has set up a further committee to advise on post-war organisation it seems desirable to emphasise this point. Even if the recommendations of this commission should prove more acceptable than those of its predecessor they should in no way be regarded as the considered wishes of the whole profession, nor put into force without further consultation. As junior members of the profession we would especially support your criticism that the opinion of members of less than ten years standing is not represented on the commission. We feel that the future might fairly seem to be a major interest for us.

ALASTAIR HUNTER,
KENNETH M. A. PERRY,
London Hospital, E.1. J. MICHAEL VAIZEY.

SIR,—A number of your correspondents have thought fit—and rightly so—to criticise the constitution of the commission on the grounds that the more junior members of the profession are not adequately represented. This neglect of the younger medical man's point of view is far-reaching and worthy of detailed consideration. Until a few years ago medicine was even more predominantly in the hands of older men than it is today, when many of our most brilliant workers are men qualified in the last ten years; and the general public is becoming reconciled to the idea of a beardless doctor whose name has been on the Medical Register for a comparatively short time. This has been one of the changes brought by the last war, but what greater changes may now be possible in a world which regards with equanimity changes and upheavals occurring almost overnight? This relative ascendancy of the young man has come in great measure from outside the profession, and many of his present-day advantages have been accorded him with comparatively little effort on his part. This may account for what seems to be his lack of interest in modern trends and tendencies. At the beginning of the war a large number of hospital residents like myself were offered contracts by the Ministry of Health at salaries beyond our wildest dreams; but when these were peremptorily cancelled by a stroke of the ministerial pen, many of those affected had scarcely a word to say about it, and the ultimate restoration of the original terms was due to their good fortune and the good sense of the ministry, and not to any vigorous protestations from the doctors themselves. At the same time, most of us had offered our services to the armed forces, but we remained subject to the rulings of local war committees, many of them composed of retired men who had little but local politics to occupy their declining years, and upon which we had no representation. For example, of a committee of six in my own part of the country only one knew me personally; and I have often wished that they had judged me unsuitable for work in the Forces, for I would then have had an opportunity to explain some of the shortcomings of the E.M.S. Surely it is evident that though the young postgraduate has been hardly used and looks like being in the rear rank again, it is in some measure his own fault and is due to his lack of interest and inertia? Young men in medicine, as in every other walk of life, must fight their own battles. Fourteen months as a "civilian in uniform" has shown me that young men in other callings have thought a great deal about the post-war period and are resolved not to allow their opportunities to slip by or be taken from them as they were from their prototypes after the last war. Young men in medicine today work hard, as hard as their fathers before them, but they tend to lose the broad view which we need so much today; and this arises partly from the ignorance of their elders and partly from their own sloth. This war is primarily one of opposing sections of the youth of the world, so let us be afforded an opportunity to add our ideas and counsels to those of our elders so that we in due time may accept more of the responsibility which is at present theirs alone.

Hammersmith, W.6. E. N. OWEN.

DYSPEPTICS IN THE ARMY

SIR,—Professor Hartfall in his letter of Jan. 25 criticises the findings which we put forward in our "Interim Report on Dyspepsia in the Army" (*Brit. med. J.* 1940, **2**, 819). We must point out that he is under several misapprehensions. First, the field work of this investigation was carried out in January–April, 1940. In consequence our cases from the B.E.F. contained a very high proportion of men who were reservists or supplementary reservists. Secondly, we were confining our investigation to men who were regarded as suffering from gastro-duodenal disease, whether organic or not, and we were not directly concerned with the various types of reflex dyspepsia. Thirdly, Professor Hartfall refers to our "alleged unselected cases." Under the heading of clinical material we give an account of our approach to the problem. In the case of B.E.F. troops we were provided with nominal rolls of all men invalided to this country. In each hospital we saw each case which had been sent over with a provisional diagnosis of any type of gastro-duodenal disease or complication of this, and also all cases which were labelled more vaguely as dyspepsia, &c. Our report is therefore correct in stating that we saw "a representative and unselected sample of the dyspeptic cases being invalided home from France." In the case of the local sick seen in the military hospitals we could not follow such a course. But we obtained from the medical specialists lists of all dyspeptic cases. Again the selection of the material was not ours. We feel that if Professor Hartfall will read our report again in the light of the foregoing he will be less inclined to find out conclusions "wholly incomprehensible."

Professor Hartfall also suggests that our findings represent a "wish fulfilment" because they include a high incidence of peptic ulceration. Before our investigation it was considered that the high proportion of dyspeptics being invalided from France might mean one of three things—new gastro-duodenal ulceration, the breakdown of old-standing ulceration, or a new condition of "soldiers' stomach." Our wish in the matter—as far as we had any—was to find sufficient new ulcer cases to make detailed analyses of the possible ætiological factors of some value. Neither of us has the slightest doubt of the importance of psychological factors in gastro-duodenal disease, or of the importance of functional dyspepsia. And in every hospital we visited we took the opportunity of discussing these aspects with the consulting psychologists. The opinion of the clinicians in the E.M.S. hospitals was uniformly that a dyspeptic case from France was almost always an ulcer case. In military hospitals there was a tendency to suspect malingering in all cases (including the gastro-duodenal ones) and at the same time to blame the presence of consulting psychologists in the Army for an increase in supposed neuroses.

Our diagnostic criteria also come under Professor Hartfall's criticism. In every case the fullest possible history was taken, often occupying 1–2 hours. This included details of every job the man had ever had, his economic conditions and his dietetic habits; and it was correlated with his general health and any dyspeptic symptoms at the various stages. After this all the laboratory data were examined. Admittedly these data were not always as complete as they might have been. We then discussed each case in the light of all the information obtained, and our diagnosis was based on a summation of the evidence. In almost every case the clear-cut history which we received would have satisfied even the most sceptical that we were dealing with organic disease.

In the "proved ulcer" cases this was supported either by the evidence of the complications of ulceration, by the laboratory evidence, or even by the objective evidence of abdominal scars. In the absence of confirmatory evidence the cases were labelled as "probable ulcers." To adopt the position which was sometimes urged of "no ulcer without a demonstrable crater" would have been to lose sight of all diagnostic perspective. In this connexion we can only repeat conclusion 12 of our report: "Our experience proved that the sorting of serious case in France for invaliding to this country was very efficient." It is clear, therefore, that we were investigating dyspepsia in the Army as it presented itself in the early part of 1940 in men from the B.E.F. and amongst the local sick. Both of us were impressed by the very small number of neuroses. The evidence which we received did, however, suggest that in the base hospitals in France there was a higher incidence of neurotic cases than was present in our material. A proposed visit to France to investigate cases on the spot was rendered impossible by the military situation. The evidence which we have recently received suggests that the dyspepsia problem now shows a much smaller proportion of organic cases, and an increase in the neurotic ones running parallel with the increase of neuroses in the Army. This is not in the least surprising, and it stresses the need for an accurate diagnosis in the individual case. The conclusions which we have put forward in our report relating to the importanceof organic disease in the clinical material which we investigated were confirmed by the experience of the medical officers in the various E.M.S. hospitals, and, with the reservations referred to, by the medical specialists in the Army. We can only report the results of our investigation on the basis of our data. To ask Professor Hartfall to accept these might lay us open to the charge of "wishful thinking."

REGINALD T. PAYNE,
Harley Street, W.1. CHARLES NEWMAN.

SULPHATHIAZOLE IN CEREBROSPINAL FEVER

SIR,—The results of treatment of cerebrospinal fever with sulphathiazole described by Dr. Banks in THE LANCET of Jan. 25 will arouse considerable interest and surprise among practitioners who have used the sulphonamide drugs in various infections, including cerebrospinal fever; certain deductions are drawn which are, we feel, not justified by Dr. Banks's explanations. Dr. Banks says that he regards as "dangerously low" a dosage of 6 grammes of sulphapyridine a day for an adult. It is difficult for the impartial reader to follow his reasons for such an assertion, reasons he discusses in the course of his paper. In the first place, he quotes two cases on this dosage which, "still had meningococci in the C.S.F. after 2½ days' treatment, a thing which never occurred after sulphathiazole in standard dosage." Surely the ultimate ideal of treatment is the cure of the patient with the absence of sequelæ, which anyone would be satisfied to achieve in a week or a fortnight in such an important disease as this! Dr. Banks describes two cases to illustrate the fate of patients treated on this scale of dosage. In case 1 the relapse occurred after a dosage of 9 g. a day at first and a total of 15 g. sulphapyridine and 43 g. of sulphathiazole in ten days. Surely this relapse followed the higher dosage as advocated by Dr. Banks; it is an error to say that it was the result of treatment on the lower dosage of sulphapyridine previously given for no more than two days.

Dr. Banks considers that two days' treatment with sulphapyridine should be enough to eradicate the disease, but he will find it hard to persuade people to believe such a result either possible or necessary, or to convince your readers that the relapse in case 1, as he asserts, was "associated with the low dosage (6 g.) of sulphapyridine in the first 2½ days." We have ourselves treated a few cases of cerebrospinal fever and other infections successfully on what Dr. Banks terms the "low dosage" and have never regretted it, nor could we have desired better results than we achieved. We have also heard of cases successfully treated by others on similar lines. We are sure practitioners all over the country will endorse our evidence that 6 g. a day for the average adult is adequate. If this is so, the prevention of the use of too large doses all over the country would, we feel, contribute to the avoidance of toxic manifestations from this group of drugs. At the same time equally good results would be obtained on the dosage now widely and generally used with such success, dosage which has given clinical success on every occasion in our experience when success could have been reasonably expected and has not been associated with the "danger" which Dr. Banks describes.

Park Prewett Hospital, Basingstoke. PHILIP H. WILLCOX,
GEOFFREY CUTTS.

HOSPITALS AND THE WAR DAMAGE BILL

SIR,—Some indirect effects of the War Damage Bill now in committee before the House have not, I think, been realised by classes affected by it. Clause 29 deals with "property held for charitable purposes," in which these two categories are included:

(1) The treatment of sickness, disease, or injury, whether physical or mental;

(2) The advancement of education, science, or research.

Category 1 directly concerns the medical profession. Category 2 interests educationists and in particular universities, colleges and teaching hospitals. A parliamentary expert much more skilled than I can claim to be in assessing the effect of proposed legislation, informs me that this clause prescribes that in return for compulsory acceptance of the "concession" of one-third only of the normal contribution (or premium) the War Damage Commission, the members of which are all appointed by the Treasury, may "if they think fit" make a compensation payment, "subject to such conditions as they may in their discretion determine." These conditions could, in the case of a hospital for example, entail rebuilding on prescribed lines in prescribed places; alter the composition of the governing body; control the appointment of staff; destroy the traditions, and impose a large measure of state management. In the case of an educational institution, the commission could, in addition to these activities, vary the curriculum, prescribe the examinations and standards of qualification, and make many other changes, not at present contemplated by the authorities concerned. It is useless to say such things could not happen; these powers are being incorporated in an act of Parliament, and may at any time be exercised.

House of Commons. E. GRAHAM-LITTLE.

THE RHEUMATIC HEART

SIR,—Over many years I studied rheumatic heart disease closely. No form of heart disease has attracted me more than mitral stenosis, because it is the most important; I have seen it fatal at 4 years and not fatal at 70. I have often directed attention to the question whether advanced mitral stenosis might result from one attack of cardiac rheumatism or must be the result of many slight attacks. Indeed this type is more suggestive of the rheumatoid changes in the fibrous tissues of the spine and other joints than any other form of heart disease. Of this I am certain—a case of long-standing mitral stenosis may after death show no myocarditis as seen by microscopic examination, and the strain on the right heart with its complications has probably been the cause of death. I am equally certain that small vegetations on the mitral valve with little or no myocardial damage are, as one would expect, not likely much to embarrass the action of the heart. This is shown by the almost complete recovery which I have observed many times and watched over for years. On the other hand, if these vegetations are associated with severe myocardial disease and damage to the mitral ring the course may be rapidly downward. This is one reason why the modern teaching that a systolic mitral murmur is not important is wrong, for this murmur may lead to the discovery of the real state of affairs.

When one finds a patient of 60 or upwards with mitral stenosis there are various factors to be considered. Is this the result of a single attack in early life followed by a very slow contraction of the valve with which the heart keeps pace? Is it the result of many slight attacks spread over many years? Is it the result of an attack of cardiac rheumatism unusually late in life, and possibly overlooked? Has the patient always lived a guarded life, or, for example, lived at the top of a steep incline? Do the fibrous tissues of one individual differ from those of another in their tendency to contraction? We know certainly that the power of the heart muscle from childhood

may vary in different people. It is my opinion that Sheehan and Sunderland, whom you quote in your annotation of Jan. 18 (p. 82), are correct in stating that in cases of mitral stenosis even when fatal there may be no myocarditis, with the proviso that there may be changes in the neuromuscular heart wall we cannot detect or have not detected, though this I personally doubt. When there are recent vegetations (to state the age of a vegetation is not easy) possibly there may then be some myocardial weakness, perhaps only passing, yet sufficient to turn the scale adversely.

Naturally as an Englishman I challenge the statement that Mackenzie was the cause of the radical change in our views about the myocardium. The first part of my work on rheumatism in the last century was to prove clinically, pathologically and later experimentally the importance of the myocardium in rheumatic heart disease, and I dare to claim some credit without being derogatory to Mackenzie whose work no-one could harm. William Broadbent and many others in London recognised the importance of the myocardium, among them D. B. Lees, who joined with me in my first paper (*Med.-chir. Trans.* 1898, 81) on the subject.

Bath. F. JOHN POYNTON.

VAGARIES OF THE PAUL-BUNNELL TEST

SIR,—The value of the Paul-Bunnell test in the diagnosis of glandular fever promises to become a matter of controversy. Whilst there is now a concensus of opinion that a positive agglutination reaction between sheep's red corpuscles and the patient's serum is strong confirmatory evidence that the case is one of glandular fever there appears to be some doubt as to the significance of a negative agglutination test. Bernstein indeed, in a recent review (*Medicine, Baltimore*, 1940, **19**, 85), seems inclined to consider that a negative Paul-Bunnell test justifies the exclusion of the diagnosis of glandular fever, but few clinicians would be prepared to go as far as this, for it is undeniable that there are many cases presenting clinical features of this disease in which the test is persistently negative. The situation is well exemplified by the two papers in your issue of Jan. 18; Dr. Barber reports 8 cases in each of which the test was positive; Dr. Fuller reports 5 cases, clinically similar, in 4 of which the test was negative and in 1 positive only to an insignificant degree. Dr. Fuller's patients were undoubtedly more ill, and they also differed in the frequency with which Vincent's organisms were found in the throat and in the fact that they were treated with sulphonamides. Otherwise the two series were very similar; in both the patients were febrile, had angina, enlarged cervical and axillary glands, and the differential white count showed a percentage increase in mononuclear cells. Clearly there are two possibilities on this evidence; either the clinical and hæmatological picture of glandular fever embraces other diseases which can only be distinguished from true glandular fever by the absence of a positive Paul-Bunnell test, or the Paul-Bunnell test is an inconstant feature of glandular fever capable perhaps of being modified by treatment or of varying with the stage of the disease. It is clearly desirable to decide between these possibilities and consideration of the hæmatological picture in the two types of case appears to give a clue to this end.

Anyone who is familiar with blood smears from this type of case stained with the Romanovsky stains is aware that there may be some difficulty in differentiating between monocytes and the different types of lymphocyte present. Some clinicians may have had the experience, as I have, of finding that different pathologists, while agreeing on the figure for the number of mononuclear cells present, differed markedly in the proportion of these cells they assigned to the category of lymphocyte or of monocyte. Nevertheless an examination of the blood-counts in Dr. Barber's and Dr. Fuller's papers suggests that such differentiation may be worth making accurately. When the numbers of the different types of white cells given for their cases are expressed not as percentages of the total number of white cells present but as the number of such white cells per c.mm. it will be seen that, while there is no apparent correlation between the Paul-Bunnell test and the number of polymorphonuclear cells or lymphocytes, there is a hint of a correlation between the test and the number of monocytes present. In Dr. Barber's series of cases, all of whom showed a positive Paul-Bunnell test, the average number of monocytes per c.mm. is about 2150; in Dr. Fuller's series the average is within normal limits at 520 per c.mm. It is perhaps significant that the one case of Dr. Fuller's whose serum agglutinated sheep's red cells showed the highest monocyte count of his series. The range of the figures for monocytes in the two series certainly overlap, and thus only allow a tentative suggestion that the difference is significant, but in view of the difficulty of differentiating monocytes from lymphocytes in these cases by the stains in routine use this objection may be resolved when staining techniques giving more sure differentiation are used. On examining the blood-counts from similar cases of my own the same relationship between a positive Paul-Bunnell test and an absolute monocytosis was found in general to hold. One of my cases, already reported (*Lancet*, 1940, **1**, 1082), is of especial interest. The illness lasted three months and while the differential count expressed as a percentage showed a relative mononucleosis throughout, the differential count expressed as the number of cells per c.mm. did not indicate a monocytosis until the last month of illness. At the commencement of the illness the monocyte count was 468 cells per c.mm. and the Paul-Bunnell test was negative; at the end of the illness the figure was 1530 and the test was then positive.

The next step in the investigation of the clinical syndrome now designated under the single title of glandular fever might be the collection of accurate data concerning the association in this condition of monocytosis and a positive Paul-Bunnell test. To this end the blood from such cases should be examined by staining techniques which permit the accurate recognition of monocytes. And to facilitate appreciation of the results thus obtained the common practice of expressing the differential count as a percentage of the total number of white cells should be discarded in favour of expressing the count as the absolute number of cells per c.mm. Should the above association be established then it is evident that it will have not only practical value but a considerable theoretical interest as showing a correlation between the increase of a certain type of cell in the blood and the development of a particular serological reaction.

H. P. HIMSWORTH.

University College Hospital Medical School.

DEATH ON THE TABLE

SIR,—I was talking to a colleague about the question of resterilisation of the operating theatre after a death has occurred on the table. We were wondering why this was done. Inquiries from nurses, sisters, and books have only told me two things:—

(*a*) No one really knows, but it's in the books and has been for years.

(*b*) That some evil spirit leaves the body at death, and desterilises all the equipment.

Is this custom a relic of the surgery of the past century? The "evil spirit," no doubt, is the *Bacillus coli* which is known to permeate throughout the body tissues after death has taken place, but I cannot help thinking that this could be of no practical significance when the body is on the table for such a short time after death.

Has anyone got a really sensible answer to this question?

Chichester. JOHN GORDON.

BERGSON IN LONDON

SIR,—In the press notices to which the recent death of Henri Bergson have given rise it appears to have escaped attention that the eloquent author of "L'évolution créatrice," some thirty years ago, lectured at University College, London. It was perhaps not without significance that the subject of the lectures at what has been satirically, but unjustly, called the Godless College should have been "the nature of the soul." The first of the four lectures was delivered on Oct. 20, 1911, in the botanical theatre of the college. It fell to me as vice-chancellor to preside, and among the large audience were the French Ambassador, Sir Francis Goodenough, Dr. Sadler, Dr. Miers, Dr. Caldecott and Dr. Dawes Hicks. The lecture was delivered in French and gained lucidity thereby, while the subject though recondite was

never obscure. Professor Bergson trounced the popular doctrine of psychophysical parallelism, holding "that we obtain through consciousness a metaphysical knowledge of mind." Among his contentions were—"that change and movement are in reality simple and that state and rest are composite." Again, "that it is in pure duration that the substantiality of the soul consists," and "it is by intuition that we obtain knowledge of the mind." These may seem hard and dark sayings to those brought up on Bain and to those who refer the psychical life to cerebral activities. They may perhaps find partial consolation in Bergson's concession "that although the psychical life in itself may be altogether distinct from the cerebral processes, it is upon the brain that our adaptation to the immediate situation, our mental equilibrium depends."

The charm of the lecturer, which had fascinated huge fashionable audiences at the Collège de France, won the sympathetic reception of his London audiences. The whole trend of the theme was in harmony with the teaching of Arthur Balfour in his philosophical excursions "towards a more idealistic interpretation of the universe," or, as Wundt was forced to admit, in "these ultimate questions of psychology we must appeal to metaphysics for an answer."

Regent's Park, N.W.1. W. J. COLLINS.

PARTING OF THE WAYS IN DIET

SIR,—The remarks of Prof. V. H. Mottram under the above heading are very apposite. Recently we have seen four cases of scurvy in adults in this hospital and one case of pellagra. There can be little doubt that a considerable portion of the population is not getting an adequate vitamin intake now. The present policy of allowing foods of high vitamin value to become very expensive, and then fixing their price above what the majority of the population can afford, is certainly not a sound nutritional policy, whatever other merit it may have. In this hospital we are at present exploring the possibility of giving capsules containing a concentration of vitamins to all patients admitted here. I feel there is every justification for this for the next three months at least, unless there is a rapid change in the country's policy towards the equitable distribution of all protective food-stuffs.

Central Middlesex County Hospital. H. JOULES.

"E. Y. D."

SIR,—You might like to tell your peripatetic correspondent of Nov. 9 (p. 607) that I think instead of saying "James Bovell," he should have written "Egerton Y. Davis" or "E. Y. D., Jr." Osler himself told me how he wrote articles over that name.

New York Academy of Medicine. ARCHIBALD MALLOCH.

*** Our correspondent writes: "Yes, I was wrong and was thinking of 'E. Y. D.,' but being in the North Sea couldn't look it up. Somewhere in Harvey Cushing's 'Life of Osler' is a picture of an agenda paper on which Osler had written 'James Bovell' about 30 times. He was, of course, one of Osler's early inspirers, an enthusiast who forgot all about his patients when playing with his microscope. I suppose Osler helped himself to get out of a dull meeting and go back to his golden days by scribbling thus, but that's a very different thing to having a double on whom to heap one's sins." The convenience of "E. Y. D." (Y stands for Yorick) to Osler was that after his indiscretions he could be safely put out of the way. Osler wrote in a preface to one of these pseudonymous papers ". . . he (E. Y. D.) was drowned in the Lachine rapids in 1884, and the body was never recovered. . . ."—ED. L.

MEDICAL SERVICE IN CHINA

SIR,—It is hoped to send a fully equipped ambulance convoy of some fifty or sixty members of the Friends Ambulance Unit to Central China as soon as possible, and the Foreign Office has approved of the expedition. A number of doctors will be required and it is hoped that the convoy will comprise a mobile operating team. Qualified men of British nationality who would like to join the convoy should apply to me.

ANDREW MORLAND,
Chairman of the Medical Subcommittee,
135, Harley Street, W.1. Friends Ambulance Unit.

CHILLY SWEEPER

SIR,—I agree with Dr. Clifford Allen—there is something wrong, and not only in Harley Street. On the main road in my own district I recently observed, as I was passing by on the other side, a man lying half dead with his clothes stripped off his back. He had obviously been attacked and seriously injured, and he was suffering gravely from wounds, shock and exposure. Surely there is some way of seeing that poor unfortunates like this should get some attention, instead of being left to die on the road? Something ought to be done by somebody.

Jericho. ADAM LEVITE.

Parliament

IN spite of a general desire to make as speedy progress as possible with the War Damage Bill, the most important measure of the present session, the House of Commons found time to give a whole day last week to the consideration of a select committee's report on the conduct of one of its own members, and to a debate on the action of the Home Secretary in suppressing two newspapers. The arraignment of Mr. Boothby, who has taken a prominent part in the political arena for a number of years, and who had just placed his feet firmly on the ladder of advancement by his appointment as parliamentary secretary to the Ministry of Food, was a task for which neither the Prime Minister nor the House as a whole had any relish. But in view of the verdict of the select committee, arrived at after the most searching inquiry, there was no alternative. Mr. Boothby was allowed the fullest opportunity to give his reasons why he dissented from the select committee's findings and then the curtain was rung down as quickly as may be on an incident which all members of the House will try to forget. Mr. Herbert Morrison found it fairly easy to dispose of the attack made on him by a very small group of members for suppressing the Communist journals, the *Daily Worker* and the *Week*. Normally the present Home Secretary would have been the first himself to challenge any attempt to interfere with the freedom of the press; but he had no difficulty in proving that the times are not normal, and that these two newspapers by their persistent attempt to obstruct our war effort had left him no option but to stop their publication. The majority—323 votes to 6—by which the opposing motion was negatived demonstrated the overwhelming support in all quarters of the House for the repression of anything which imperils our war effort. The remainder of the week's sittings of the House of Commons were taken up by a detailed examination in committee of the earlier clauses of the War Damage Bill. The House is passionately anxious that the bill when it becomes an act shall really bring a substantial measure of help to those whose property has been bombed, and particularly to the small house-owner. In practice however this is not at all easy, and as the debate has proceeded a fear has been growing that injustice and hardship may result from the decisions of the War Damage Commission. The Chancellor of the Exchequer frankly admitted the difficulties and complications of the position, but assured the House that the desire of the Government is to do the fair thing.

QUESTION TIME

Medical Prisoners of War

Prof. D. L. SAVORY asked the Secretary of State for War what steps were being taken to facilitate the repatriation of medical officers serving in His Majesty's forces, and now captives in Germany.—Captain H. D. R. MARGESSON replied: The German government have been informed that His Majesty's Government are ready to repatriate the German medical personnel who are entitled to repatriation under the Geneva Convention of 1929, if the German government will also conform to the terms of the convention as regards British medical personnel in their hands. The matter is being actively pursued, but a satisfactory settlement has not yet been reached.

Artificial Shortage of Doctors

Sir FRANCIS FREMANTLE asked the Minister if he would consider the seconding of medical officers from the Army, with arrangements for their instant recall in case of need, to relieve the excessive demands made on medical practitioners by the

calling up of younger men and by the greatly increased demand for medical attention to the civil population during the winter months.—Captain MARGESSON replied: Applications for the temporary release from the Army of medical officers to meet the needs of the civil population have been, and will continue to be, sympathetically considered, but it must be remembered that the Army can ill spare their services. Sir F. FREMANTLE: Does the Minister realise that something like 8000 medical officers have been taken from civil services to the forces although civil needs are greater now than they were in normal times, because of bombing casualties? Is he aware also that a very large number of Army medical officers have very little to do, while the civil services offer a very great deal of work that they can do?

Mr. RHYS DAVIES: Is the Minister keeping in touch with the Ministry of Health on this problem?—Captain MARGESSON: Yes.

Medical Referees

In reply to a question Mr. O. PEAKE, under-secretary to the Home Office, said: Ophthalmologists have been appointed as medical referees under the Workmen's Compensation Act for the sheriffdoms of Lanark, Lothians and Peebles, and Renfrew. Medical referees to deal specially with cases of scheduled diseases (including dermatitis) have been appointed for the sheriffdoms of Lanark and Renfrew. The Minister appreciates that it may be desirable to strengthen the panels of medical referees in these and other areas by more extensive appointments of specialists, and he will be very glad to consider representations in regard to any particular area; but experience shows that it is extremely difficult to secure the services of suitable specialists as referees under present conditions.

Health Services at Newquay

Mr. P. L. HORABIN asked the Minister of Health whether he was aware of the unsatisfactory state of the health services in Newquay; and whether he proposed to take any action to improve them, in view of the large increases of the population due to the billeting of official evacuees in the town.—Mr. M. MACDONALD replied: I am aware of the position in the district. The county health services have recently been strengthened by the appointment of an additional assistant county medical officer, the seconding of six school-nurses to the county by the London County Council, and the expansion of the district medical service. Local health services have been improved by the establishment of a general sick-bay and of a special sick-bay and clinic for skin cases. Further steps at present under consideration include the appointment of another assistant county medical officer, part of whose time would be devoted to this area, and the provision of additional hospital accommodation for cases of infectious disease.

Gastro-duodenal Disease in the Army

Sir FRANCIS FREMANTLE asked the Secretary of State for War what percentage of cases invalided from the British Expeditionary Force to this country were suffering from gastro-duodenal disease; and whether strict instructions would be given to recruiting boards to reject men with a history of organic dyspepsia and save the loss and inefficiency caused thereby to the Army.—Captain MARGESSON replied: The percentage of patients suffering from gastro-duodenal disease among hospital cases invalided from the British Expeditionary Force was 11·76. As regards the second part of the question, strict instructions on the point have already been given to recruiting medical boards.—Sir F. FREMANTLE: Is the Minister aware that these instructions are not very effective, and that these men are a very great cause of trouble, loss of morale and inefficiency in the Army? Is it not a great waste of Army effort, and should not an effort be made to bring the facts home to recruiting boards?—Captain MARGESSON: I will press the matter in that direction.

Mr. C. STEPHEN: Will the Minister see that in cases where men are weeded out pensions will be given?—Captain MARGESSON: That is a matter for the Ministry of Pensions.

Inoculation in the Services

Mr. W. LEACH asked the First Lord of the Admiralty whether he was aware that a number of men in H.M.S. *Colombo* had been deprived of shore-leave for refusing inoculation; and whether, in view of the fact that the reports on the health of the Navy disclosed the occurrence of a considerable number of cases of typhoid fever in inoculated men, he would follow the precedent set by the Admiralty in the last war when similar cases of deprivation of leave occurred and permit objectors to inoculation to have leave in the same way that inoculated men were allowed it.—Sir VICTOR WARRENDER, parliamentary secretary to the Admiralty, replied: Men who have declined inoculation against a particular disease are by Admiralty order precluded from receiving shore-leave at places where that disease is liable to be contracted. This is a precautionary not a punitive measure, and in other places no restriction is placed on leave. I am aware that a number of men in H.M.S. *Colombo* have refused inoculation and have, therefore, been refused shore-leave at various places. The rule mentioned above was introduced in 1916. I can find no instance of any exception to it. After careful consideration I do not feel able to authorise any exception now in view of the importance of taking every precaution to prevent the introduction of disease on board one of H.M. ships, especially in war-time.

Reinforced Flour

Sir ERNEST GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food if he still proposed to add to the flour for the reinforced loaf, described in the debate on July 18, a certain undefined proportion of a calcium salt, whether he was aware that a recent research based on experimental and chemical data and conducted at the Liverpool Institute of Research threw doubt upon the assumption that there was any general deficiency of calcium in the people's diet, and indicated that there was danger in increasing the calcium content in the manner proposed.—Major LLOYD GEORGE replied: The answer to the first part of the question is yes. As regards the latter part of the question, the Minister is advised that the results of the research work referred to are under consideration on behalf of the Medical Research Council, but that it already appears that there are reasons for mistrusting the conclusions drawn from the Liverpool experiments.

Mr. LEACH: Will white flour unadulterated with vitamin B and calcium salt be available after the fortified white flour is put on the market; and will the fortified white flour be labelled to show that chalk and a chemical substance have been mixed with it?—Major LLOYD GEORGE: The decision announced on behalf of the Government in the House on July 18 concerned the addition of vitamin B_1 and a calcium salt to white flour used for bread-making. No decision has yet been reached on the question of similarly fortifying all white flour.

Convalescent Homes for Seamen

Miss E. RATHBONE asked the Minister of Health whether he was satisfied that there was sufficient provision of convalescent homes for merchant seamen and trawlermen; whether he was aware that many of them, especially from the trawlers, had to go straight back to their ships from hospital; how many of such homes existed; and whether the number could be increased or other convalescent accommodation provided.—Mr. MACDONALD replied: Apart from the convalescent accommodation specially provided for this class merchant seamen and trawlermen who are casualties are treated in the emergency hospitals and convalescent homes. Approximately 100 of the latter have been opened under the Emergency Scheme and others will be available later. The question of admitting merchant seamen and trawlermen who fall sick or require treatment for other reasons into these convalescent homes is under consideration.

Imported and Non-essential Drugs

Sir FRANCIS FREMANTLE asked the Minister what steps had been taken to limit the prescription by medical practitioners of non-essential imported drugs, and the sale of such drugs as ingredients in proprietary medicines, and to suggest alternatives produced in this country.—Mr. MACDONALD replied: A defence regulation has been made on this subject and its details will be published in the course of the next few days.

Gas Helmets for Babies

In answer to a question Mr. HERBERT MORRISON said that his department had issued about one and a quarter million anti-gas helmets for babies.

Transfers of Panel Patients

Mr. T. E. GROVES asked the Minister whether he would now arrange that any panel patient whose chosen practitioner had joined the forces might forthwith transfer to the list of any remaining practitioner willing to accept him, without regard to any unofficial scheme for the protection of practices which might be operating in the district.—Mr. MACDONALD replied: In view of the very general participation of insurance practitioners in these schemes and the importance of safeguarding the interests of practitioners who have undertaken war service, I see no sufficient reason for action.

Obituary

PENDRILL CHARLES VARRIER-JONES

KT., M.A. CAMB., F.R.C.P.

Sir Pendrill Varrier-Jones, director of Papworth Village Settlement, died from a heart attack on Jan. 30, within a fortnight of the silver jubilee of the foundation of the colony which he started at Bourn and later moved to Papworth. Papworth was his life's work, but he was always seeking new activities and at the time of his death he was planning to add teaching to his other work. Only an hour or two before his death he wrote a long letter to Sir Walter Langdon-Brown enthusiastically describing his new scheme. He wanted to hold a course at Papworth on the diagnosis and treatment of tuberculosis in which special attention would be given to the sociological and economic aspects of the disease. He had drafted an announcement of the course to appear in our columns. We can hope that the scheme may still fructify as a memorial to a pioneer in the restitution of the tuberculous to independence.

Varrier-Jones was born at Troedyrhiw, Glamorgan, the son of Dr. Charles Morgan Jones, and he was a Celt, with all the Celt's fire and imagination, and with the long black hair and gestures of an impresario. He was commonly known as the Pendragon, and this nick-name later became the trademark of the Papworth goods. He was educated at Epsom College and St. John's College, Cambridge, where he was a foundation scholar and prizeman. He obtained a first in the natural sciences tripos in 1905 and qualified from St. Bartholomew's Hospital in 1910. While acting as a temporary tuberculosis officer for Cambridgeshire in 1914 he was impressed with the futility of advising the tuberculous workman to find a light job in the open air and eat good nourishing food. As Kingston Fowler was later to say, "a working man has no time to be an early case of pulmonary tuberculosis." Varrier-Jones's reaction was to start his village settlement and among his supporters in the early days when help was most urgent were Clifford Allbutt, Sims Woodhead, whose name is commemorated in the laboratory at Papworth, and Sir Humphry Rolleston, who only gave up his chairmanship of the settlement a few months ago. Outside Papworth Varrier-Jones also served the handicapped as chairman of the rehabilitation committee of the International Union against Tuberculosis, as a member of the Central Council for the care of Cripples, and as honorary consulting tuberculosis officer for Cambridgeshire.

Of his "great preceptor" Dr. J. B. McDougall, medical director of the British Legion Village at Preston Hall, has written: Few men have accomplished so much in so short a time. In twenty-five years Varrier-Jones saw the birth, growth and development of a scheme which bridged the gap between medicine and industry in a way which was original in conception and successful in practice. The Papworth "experiment" has long passed the experimental stage and has been emulated with more or less success in this and other countries, but with very few exceptions the results have never been comparable to those which Varrier-Jones achieved in the place which he himself created. There was never any doubt that his administrative abilities exceeded his clinical accomplishments, though it can never be said that Papworth failed to concentrate on research and on modern methods of treatment. But he had himself little time left for the detailed work which clinical examinations and research work involve. That he succeeded in creating a large sanatorium and industries was in itself a tremendous task, but that he was able to obtain the capital which made his extensions possible year by year singled him out as a great figure in medical socio-economics. I know well the strain which this made on him. It was his own personality which made Papworth possible and I doubt whether he would have reached the same pinnacle of fame had he been forced to administer a similar unit under the restrictions and guidance of any local authority. From the inception of the small settlement at Bourn, he remained in supreme control, dictating policy to the minutest detail. He threw himself into the ramifications of the various industrial departments with the ease of a master of industry, and was quick to detect the markets which were waiting for the products of disabled men and women. In his position of isolation as the leader of a new conception in medicine he had little time for committees, conferences and the like. In addition to Papworth he was called upon at different times to advise and organise new schemes in other parts of the country—at Enham, where he built up successful markets for the industries run by patients suffering from nervous diseases; at Peamount Sanatorium, Dublin, where a promising settlement was set going some ten years ago; and at Preston Hall where he reorganised the institution at a time when the British Legion assumed administrative control. Abroad, his services were in constant demand and I remember visiting with him Claire Vivre, the new settlement in the Dordogne—a scheme which was killed almost at its inception by the intervention of political prejudices. After a brief tour of the institution, houses and workshops he suggested that two years should bring the scheme to a conclusion. I thought it might last a little longer, but as usual he was right. "If only they would pay attention to principles and leave details to look after themselves" was his comment.

We have lost a leader in tuberculosis thought and an administrator of superlative ability.

WILLIAM CECIL BOSANQUET

D.M. OXFD, F.R.C.P.

Dr. Cecil Bosanquet was leisurely and learned. His students enjoy remembering his ward rounds; the questions he dropped were never pressed home on the faltering, and the replies, however remarkable, were courteously if quizzically received. He never deliberately made anyone look a fool, but he made all feel that medicine was a vast, largely untravelled field, and that perhaps the last word had not been said in the latest textbook after all. Students learned from him not facts so much as an attitude to the work they were beginning. His consideration for the patient always transcended the convenience of the teacher. And his aphorisms, punctuated by his gentle sniff, were hugged and carried away, to be repeated round the medical school.

Elliott & Fry

He was the son of Admiral G. S. Bosanquet and was educated at Eton, where he was a King's scholar, and New College, Oxford, where he took a double first in greats in 1889. He was a fellow of his college from 1890 to 1897, when he took his B.M. and D.M. He became F.R.C.P. in 1904. He was appointed physician to Brompton and Charing Cross Hospitals and physician to the London Lock Hospital, and had held a majority in the R.A.M.C. (T.), from which he had retired. He was also consulting physician to the North-West Frontier Force of India, and physician to outpatients at the Victoria Hospital for Children.

Bosanquet was not gregarious. Some of his colleagues worked with him for more than twenty years without learning anything about his personal life, or even knowing where he lived or what he did in his spare time. He gave the impresson of being a man with a fine brain who had lost his enthusiasms. He would tease his colleagues about theirs, and then apologise very kindly and make amends by offering wise and critical advice. He was jealous of the good name of Brompton Hospital, and the *Brompton Hospital Reports*, which were begun in 1932, were his idea. He became senior editor and made happy comments in the margins of the galleys submitted to him. When he left the active staff the lay board of management invited him to join them; he accepted and attended meetings punctiliously. He seldom thought a matter worth taking a stand over—his usual attitude was expressed in a tolerant shrug—but when he did he was not to be shaken. His standards of justice admitted of no compromise.

Most of his written work was on underlying principles rather than on patients and he edited successfully the thirteenth edition of "Green's Pathology." An early

work on serums, vaccines and toxins was written in collaboration with Professor Eyre, who pays tribute to the spadework which Bosanquet never spared to ensure meticulous accuracy in his premises, a feature of which his easy polished writing gave little hint. In 1937 he published "Meditatio Medici," a book informed with his wide culture and tolerance.

He died on Jan. 24, at the age of seventy-four. During the last few weeks of a distressing illness nothing was more in evidence than his innate gentleness and courtesy, which seemed to show themselves more and more as his bodily strength grew weaker. Indifferent to his own feelings and to the consciousness of failing powers, he thought only of those around him and of how he could still be to them the kindly and gracious host that he always was.

R. A. Y. writes: Bosanquet did not seek popular acclaim, or strive after financial success. He brought a keen and critical acumen to the study of disease, which was almost too exacting for the mutable criteria of modern medical science. He had an absolute conception of right and wrong. He would sacrifice his own interests where he felt by making such a protest he could achieve what he regarded as correct and rectify a seeming injustice. It was perhaps a misfortune that he eventually turned to clinical medicine rather than to its experimental and laboratory problems. He was a philosopher, a thinker and a student rather than a profound clinician. It was probably because his sympathies were great and his kindness of heart impelling that he was attracted to the study and treatment of the sick patient. With such a character, it can easily be recognised that he was a loyal colleague and a source of strength to any hospital committee. His double first at Oxford in literæ humaniores was apparent in his conversation and in all he wrote, for his words were well chosen and apposite. He was a wit in every sense of the word—quick, incisive and even caustic in repartee on occasion—but he was never unkind. His most severe mot would be delivered slowly and with a disarming smile, which left no possible sting. I remember in the last war we both had house-physicians of far Eastern origin. In comparing notes, Bosanquet told me he thought that he and his house-physician esteemed each other, but did not always quite understand one another's English.

ELIZABETH HURDON

C.B.E., M.D. TORONTO, F.A.C.S.

IN 1925 the London Association of the Medical Women's Federation decided to develop a scheme of controlled research in the treatment of uterine cancer by radium at four hospitals staffed by women and Dr. Hurdon was appointed as director to coördinate methods and to analyse and record results. In 1929 the four clinics were fused into one unit and the Marie Curie Hospital was founded at Hampstead. Under Dr. Hurdon's direction the results achieved there, first with radium alone and later with X rays were, in the words of Dr. Henri Coutard, among the best in the world.

Elizabeth Hurdon was born at Bodmin, the daughter of John and Anne Coom Hurdon, and she died at Exeter on Jan. 29. She went to school in Canada and qualified in medicine from the University of Toronto in 1895. She went at once to Baltimore where a post at an evening clinic for working women was awaiting her. This job paid her living expenses and left her free for what she really wanted—postgraduate work in the pathology department of the Johns Hopkins, under W. H. Welch. But soon H. A. Kelly, head of the department of gynæcology, offered her a more regular appointment at the hospital and she was able to give up her outside work. After three years she was officially recognised by the university and became an assistant and later associate in the department of gynæcology. She obtained her F.A.C.S. in 1913. In 1916 she was granted leave of absence and volunteered for service with the R.A.M.C. She served in Malta and Salonika where she was at one time in charge of the dysentery camp of the 63rd General Hospital. She was demobilised in 1919 and returned to the Johns Hopkins where her post had been kept open for her. But family affairs forced her to resign the following year and return to this country, where for five years she led what she deprecatingly called the life of a lady of leisure. Without a hospital appointment there did not then seem to be any opening for a gynæcological surgeon, and though in an emergency she went to the University of Liverpool as a temporary lecturer in pathology she did not find in general pathology the proper outlet for her powers. The Marie Curie scheme gave her the opportunity she was seeking, and after a round of visits to pioneer centres of radium therapy she began her new work. She retired in 1938 and was awarded the C.B.E. in the same year. Her all too brief retirement was filled with travel and gardening.

The portrait is from the cover of the *Medical Women's Journal* (Cincinnati) for September, 1936.

THOMAS JAMES MORTON

M.B. CAMB.; SURGEON LIEUTENANT, R.N.V.R.

Dr. Morton was killed last month in a dive-bombing attack on a cruiser in the Mediterranean. He was 29 years of age and the only son of Dr. John Leyden Morton and grandson of Dr. Thomas Morton, who both practised in West Hampstead. He was educated at St. Peter's School, Seaford, at Marlborough College, and at Clare College, Cambridge. He obtained an entrance scholarship to Charing Cross Hospital and took his conjoint qualification in 1936. The same year he also graduated M.B. Camb. He was house-physician to Dr. Gordon Holmes and house-surgeon to Mr. Norman Lake. He was appointed medical officer to the Hull and Sculcoates Dispensary and he held this post until he was called up for service with the R.N.V.R. shortly before the outbreak of war. He married Miss Patricia Smith of Hessle, near Hull.

Barrie, Edinburgh

THOMAS VINCENT DICKINSON

M.D. LOND., M.R.C.P.

Dr. Vincent Dickinson who died in London on Jan. 21 in his 83rd year, was the son of Dr. Thomas Dickinson who practised in Chelsea. He was educated at King's College and St. George's Hospital from which he qualified in 1879, taking high honours later at the London M.B. and M.D. After spending some years in house appointments he got on the staff of the Chelsea Hospital for Women and settled in the neighbourhood of Sloan Square, where he remained throughout his life. Of a quiet retiring disposition he was a man of wide interests and deep sympathies, which soon became apparent to those who were privileged to know him. For many years he was associated with the Italian Hospital in London; his knowledge of Italian caused him to take an active part in the development of cultural relations with Italians resident in London and he was one of the leading spirits who made the Anglo-Italian Literary Society a common meeting ground for Italians and British lovers of Italy. For his services to Italians during the last war he received special mention and was made commander of the Order of the Crown of Italy. Medieval medicine had a fascination for him and he also took an interest in City life, past and present. He was master of the Apothecaries' Company in 1925–26. One of the outstanding events of his term of office occurred when, accompanied by the wardens, he attended at St. James's Palace to confer upon the Prince of Wales, afterwards King Edward VIII, the honorary diploma of the society—the highest honour which the Society of Apothecaries can confer. A detailed description of the society's armorial bearings also came from his pen. In 1892 he married Beatrice, daughter of Captain S. H. Evens, Royal Fusiliers, who survives him with a son and daughter.

ALEXANDER LEWIS McMILLAN
M.D. GLASG.

Dr. A. Lewis McMillan who died at Bridge of Weir on Jan. 21 graduated at Glasgow University in 1887. He took his M.D. two years later and started to practise in Newton-on-Ayr, but he soon returned to Glasgow where he practised for nearly fifty years. He early became interested in ophthalmic surgery and in 1892 was appointed assistant to Freeland Fergus at the Glasgow Eye Infirmary. This was the beginning of a long association with that institution which lasted until he retired from the post of surgeon in 1918. In 1921 he became visiting oculist to the Glasgow fever hospitals and from 1927 till his retirement from medical practice in 1937 he was attached to the Glasgow public health department in connexion with pensions for the blind. He maintained a close interest in the affairs of the Lansdowne Church and did much benevolent work in a quiet and unostentatious way. His wife died some years ago but he is survived by two sons and three daughters.

Medical News

Royal College of Physicians of London

At a comitia of the college held on Jan. 30, with Sir Robert Hutchison, the president, in the chair, the following representatives of the college were elected: Sir Charles Wilson, Dr. H. L. Tidy, Prof. J. A. Ryle and Prof. H. P. Himsworth on the British Medical Association Medical Planning Commission; Dr. A. Feiling on the council of the Queen's Institute of District Nursing; Dr. Stanley Barnes on the court of governors of the University of Birmingham; Dr. P. Hamill on the advisory committee of the Ministry of Health to compile a war emergency formulary. Dr. W. E. Lloyd was appointed an examiner in pathology and Dr. G. Roche Lynch was appointed an examiner in public health.

The following candidates, having satisfied the censors' board, were admitted to the membership:—

J. B. Arthur, M.B. Edin.; J. D. Ball, M.B. Lond.; T. E. D. Beavan, M.B. Birm.; A. J. Bernfield, M.B. Lond.; Stanford Cade, F.R.C.S.; W. E. Clarke, M.B. Lond.; Constance E. Field, M.D. Lond.; M. O. J. Gibson, M.B. Camb.; A. G. Heppleston, M.B. Manc.; H. M. James, M.B. Camb.; R. B. Magill, M.B. Belf.; R. H. Mole, M.B. Oxf.; N. V. Nene, M.B. Bombay; Elizabeth H. Rosenberg, M.B. Lond.; Gerard Sanderson, M.B. Lpool; S. P. Sinha, M.B. Patna; G. R. Steed, M.D. Lond.; C. H. C. Upjohn, M.B. Camb.; C. K. J. Vautier, M.B. N.Z.; Celia K. Westropp, M.B. Oxf.

Licences to practise were granted to 177 candidates (155 men and 22 women) who have passed the final examinations of the conjoint board and complied with the by-laws of the college. The following are the names of the successful candidates:—

J. P. Adlam, Bennie Alexander, A. J. C. Allen, G. J. Amiel, A. W. Anderson, C. M. Arango, Alfred Arnstein, M. W. Arthurton, Walter Aspinall, Islay C. Barne, Jack Barrow, D. H. Bennett, F. A. Binks, Andrew Bogdanovitch, Claude Brun, J. M. Burbury, C. R. K. Carroll, D. I. Chapman, H. R. Claff, Lionel Cohen, Brenda Collar, C. W. Coplans, J. A. B. Cotsell, W. R. Cyrlas-Williams, J. H. Dadds, E. B. Dawe, Joseph Denfield, G. D. Denlow, A. G. Doughty, C. E. Drew, Margaret D. D. Dudley-Brown, C. T. F. Ealand, W. K. Earle, H. H. G. Eastcott, Christine Ecroyd, E. M. Ensor, E. G. Essery, Joan Fitzherbert, B. J. Fowler, A. J. Fraser-Simson, S. M. Frazer, Franz Freund, P. D. Gange, O. F. Garai, Leo Garland-Collins, A. J. Gaskell, J. E. Gilbert, R. A. Gill, B. M. Girgis, Gerald Godfrey, A. H. F. Gow, C. N. Grainger, J. C. Gray, J. L. Greaves, Barbara J. Greenwood, C. H. Greer, A. G. Gregory, E. W. Guillaume, J. W. P. Gummer, A. W. Hagger, F. A. H. Hall, Winefride M. Hamilton, G. P. Hartigan, P. L. M. Hartley, M. C. Head, E. H. Hemsted, G. G. Henn, Maurice Hershman, J. H. Hicks, A. C. Higgitt, G. de B. Hinde, J. C. Holman, Emily M. Horsfall, E. W. Hyde, N. N. Iovetz-Tereshchenko, J. D. James, Elizabeth E. Johnson, A. C. V. Jones, H. W. Jones, H. P. Jones, H. O. Jones, R. D. Jordan, H. L. Joyce, Henry Kanter, Marie D. Kelleher, R. E. Kelly, E. R. Keyworth, J. H. Kirkham, S. H. Kutar, R. U. F. Kynaston, Bernard Lewis, D. W. Liddell, Isabelle G. Little, R. R. H. Lovell, N. W. R. Lucas, Silvia C. Lucas, W. C. Lyon, G. E. McFall, W. E. Mahon, Jankinath Manhas, F. R. C. Manning, L. W. C. Massey, T. R. Maurice, Joyce B. M. Mayes, F. B. Meade, V. C. Medvei, Joan S. Millett, A. F. Mohun, R. A. R. Montgomery, J. V. Morris, Madeleine B. Morris, J. H. M. Munro, Smarn Muntarbhorn, T. A. Narayanan, L. P. A. Newborne, D. J. O'Brien, William O'Brien, C. B. O'Carroll, E. E. Oddie, F. H. Packer, R. H. A. Parker, C. N. Partington, A. J. Patenall, G. H. Pearson, Rosa M. Piggot, Louis Portelli, F. T. G. Prunty, S. D. Purcell, Harold Reeback, H. N. Reed, P. A. Rees, R. L. Rees, R. E. Renaud, G. K. C. Rettie, R. E. Rewell, Florence C. R. Richardson, Kathleen P. Richardson, M. J. Riddell, E. F. Ridley, Ronald Robins-Browne, G. K. T. Roche, J. A. J. Sandilands, Witold Schey, Isabel B. Schooling, C. M. Shafto, R. G. Sheppard, J. C. Smith, R. J. Stanley, R. B. Stark, Tobias Sternberg, J. N. Stirling, H. A. W. Stormont, R. J. Stout, F. G. Strong, P. N. Swift, J. M. Swithinbank, M. R. Thompson, D. N. Thornton, Robert Tilley, St. J. M. A. Tolhurst, Samuel Tomback, Eileen D. Trafford, Ruth D. Usher, P. C. van der Westhuizen, A. S. Veeder, J. H. E. Verdon, G. B. R. Walkey, F. J. H. Walters, W. R. Watson, S. D. V. Weller, B. W. Wells, Moyra Welply, Hermon Whittaker, R. D. Wilkins, R. J. G. Williams, A. R. H. Williamson, J. B. Wyman.

Diplomas were granted jointly with the Royal College of Surgeons, to the following candidates:—

D.P.H.—G. P. Charles, Gwendoline M. Edwards, Joan M. Faulkner, Samuel Leff, I. B. Sen Gupta.
D.M.R.—Benjamin Jolles, J. H. Wilding.

Diplomas in anæsthetics and in laryngology and otology were also granted to the candidates named in the report of the meeting of the Royal College of Surgeons in our issue of Dec. 21, and in psychological medicine to those named in our issue of Jan. 18.

University of London

At recent examinations the following were successful:—

DIPLOMA IN CLINICAL PATHOLOGY

A. R. Aldin, J. W. Clegg, J. T. Quinlan, Gaya Prasad, J. H. Stritch, Freida Young.

University of Oxford

Lord Nuffield has given £25,000 to the university to encourage research in ophthalmology. The money is to be used to appoint a research assistant to the Margaret Ogilvie reader in ophthalmology.

Radium Gift from America

Two centres for the supply of radon are working in this country, but the supply still falls far short of the demand. When this was made known to the British War Relief Society in New York, through its British representative, £5000 was speedily cabled to London to remedy the deficiency. To give effect to the gift at the earliest possible moment the British Hospitals Association approached the Middlesex Hospital, which consented to start and administer another centre for the supply of radon, and work has already begun on it.

Health of the Student

At the annual convention of the Scottish National Union of Students in Aberdeen the recommendation of its medical office to set up a student health-insurance scheme was adopted. The medical office urged the establishment of routine medical inspection for students and the formation of a small medical panel in university towns. Younger teachers whose interest in students' welfare was known would compose the panel of advisors, and students could choose their own doctor by registering with the local students' representative council and paying a fee of 10s. or £1. Dr. J. H. F. Brotherston, director of the medical office, said that already medical inspection at certain of the universities had found many unsuspected cases of tuberculosis and one or two of diabetes and nephritis.

Since the publication of the last list of subscriptions to the Medical War Relief Fund, £1700 has been received, bringing the total to over £16,000.

Colonel Walter Elliot, sometime Minister of Health, has been appointed director of public relations at the War Office in succession to Major-General J. H. Beith.

A meeting of the Paddington Medical Society will be held at 3 P.M. on Tuesday, Feb. 11, at the new tuberculosis dispensary, 14, Newton Road, W.2, when Dr. Alexander Baldie will open a discussion on the medical aspect of civilian morale and crime in war-time.

In recent casualties lists the following deaths are announced: Major J. S. McMillan, I.M.S.; Captain G. C. Retz, M.B. Dubl., I.M.S.; Lieutenant F. C. McLaren, M.B. Glas., R.A.M.C. It is also announced that Probationary Temp. Surgeon Lieutenant C. L. Pretre, M.R.C.S., R.N.V.R., of H.M.S. *Acheron* is missing, presumed killed.

The Minister of Labour and National Service reminds employers that the regulations prescribing standards of lighting in certain factories came into force on Feb. 1. The new regulations (see THE LANCET, 1940, **2**, 573) are based on the fifth report of the Departmental Committee on Lighting in Factories.

In view of the number of nursing matters which come under the control of the Ministry of Health in war-time, and to prepare for postwar developments, the Royal College is urging the Minister of Health to establish a division of nursing within the ministry, which would be administered and staffed by suitably trained and experienced nurses.

On Tuesday, Feb. 18, at 2.15 P.M. at the section of comparative medicine of the Royal Society of Medicine Prof. T. J. Bosworth, D.V.S.M., Mr. Frederick Blakemore, D.V.S.M., Dr. H. H. Green and Dr. M. Murray will open a discussion on fluorosis in man and animals. At the same meeting Dr. Eugene Nassau will read a paper on the culture of tubercle bacilli from laryngeal swabs. The section of orthopædics will meet on Saturday, Feb. 22, at 11.30 A.M., at Bothley's Park War Hospital, Chertsey, Surrey, when Mr. W. Rowley Bristow will open a discussion on injuries to peripheral nerves. On Tuesday, Feb. 25, at 2.30 P.M., Dr. C. P. Symonds will deliver his postponed presidential address to the section of psychiatry. He will speak on the neurological approach to mental disorder.

The Davyhulme Military Hospital Medical Society held its inaugural meeting on Jan. 30 when Major R. W. Fairbrother read a paper on cerebrospinal meningitis. The object of the society is to encourage medical men and women in all the services (including civilian) to meet together to discuss problems of common interest and membership is open to any medical man or woman in the area. The next meeting will be held at the hospital on Thursday, Feb. 13, at 3 P.M. when Lieut.-Colonel W. E. Underwood will read a paper on gunshot wounds in the field. Further information may be had from the hon. secretary, Major William Brockbank, Military Hospital, Davyhulme, Nr. Manchester.

Births, Marriages and Deaths

BIRTHS

DOBBIN.—On Jan. 31, at Crondall, Hampshire, the wife of Dr. Leonard Dobbin—a son.

HALLAM.—On Jan. 29, at Reigate, the wife of Dr. H. N. Hallam—a son.

LYSAGHT.—On Jan. 30, at Bridgend, Glam, the wife of Mr. A. C. Lysaght, F.R.C.S.—a son.

PATERSON.—On Jan. 24, at Kingston, Ontario, the wife of Captain John F. Patterson, R.C.A.M.C., of Little Baddow, Essex—a son.

MARRIAGES

BISSET—ALEXANDER.—On Jan. 23, at Perth, George Maxwell Fraser Bisset, M.B., to Arlette Myrtil Alexander.

BONE—MACLEOD.—On Feb. 1, at Ealing, Alan W. Bone, F.R.C.S., younger son of Dr. J. W. Bone, to Sheila Margaret MacLeod.

KERSHAW—COWELL.—On Jan. 23, at Bramhall, William Edgar Kershaw, M.B. Manc., Surgeon Lieutenant R.N.V.R., to Maureen Alexa Clayton Cowell.

MOYNAGH—MARTIN-HARVEY.—On Feb. 1, at Beckenham, Kent, Kenneth Desmond Moynagh, M.R.C.S., Captain R.A.M.C., to Drusilla Wendy Martin-Harvey.

DEATHS

ACKERY.—On Jan. 29, Edward Faulknor Ackery, M.R.C.S., late medical registrar, Royal Dental Hospital, London, aged 65.

ARMSTRONG.—In January, by enemy action, Keridwen St. Valentine Armstrong, M.D. Lond., wife of Dr. J. V. Armstrong.

CHAPMAN.—On Jan. 31, at King's Somborne, Charles William Chapman, M.D. Durh., M.R.C.P., late of Wimpole St., aged 97.

DUN.—On Jan. 31, at Shrewsbury, Robert Craig Dun, M.B. Edin., F.R.C.S., late of Liverpool.

EVANS.—On Feb. 2, at Herne Bay, Robert Cecil Turle Evans, M.B. Lond., aged 69.

FORREST.—On Jan. 28, at West Manse, Auchterarder, Robert Sibbald Forrest, M.B. Edin., aged 76.

GORDON.—On Feb. 2, at Bedford, Edward Gordon, M.C., M.B. Aberd.

HURDON.—On Jan. 29, at Rockleigh, Exeter, Elizabeth Hurdon, C.B.E., M.D. Toronto, F.A.C.S.

MCFADYEAN.—On Feb. 1, at Hindhead, Sir John McFadyean, M.B. Edin., M.R.C.V.S., aged 87.

MEAD.—On Jan. 28, M. Theophilus William Mead, M.R.C.S., of Portsmouth.

PRATT.—On Feb. 4, Edward Frederick Pratt, M.B. Durh., of Lansdowne House, Berkeley Square, W., aged 74.

REES.—On Jan. 29, at Swanage, William Arthur Rees, M.D. Lond., F.R.C.S.

ROBINSON.—On Jan. 29, at Worthing, Florence Ada Robinson, L.R.C.P.E.

SPROTT.—On Jan. 29, Andrew Sprott, M.B. Glasg., of Appleby, aged 74 years.

VARRIER-JONES.—On Jan. 30, at Papworth Hall, Cambridge, Sir Pendrill Varrier-Jones, M.A. Camb., F.R.C.P.

Appointments

CROSS, A., G., M.B. Camb., F.R.C.S.: hon. consulting ophthalmic surgeon to the Wimbledon Hospital.

DAVIDSON, A. H., M.D. Dubl., F.R.C.P.I.: visiting gynæcologist to the Royal City of Dublin Hospital.

GARLAND, ANDERSON, M.D. Lond., M.R.C.P., D.P.H.: asst. M.O.H. for Lincoln.

GRAY, T. G., M.B. St. And.: R.S.O. at Blackburn Royal Infirmary.

HAMILTON, ALISON M., M.B. Edin., D.P.H.: asst. pathologist at the Royal Infirmary, Sunderland.

Notes, Comments and Abstracts

MIGRATION OF INSURED PATIENTS

IMMEDIATELY before the outbreak of war the Ministry of Health issued a circular to all insurance committees, pointing out that some latitude would have to be allowed as regards the maximum number of insured persons permissible on practitioners' lists. The minister approved an addition of 500 to the prescribed maxima. In the 16 months which have passed since then the demands of the military authorities for practitioners have become more and more clamant. The London Insurance Committee has been particularly affected and have appealed to the Central Medical War Committee to avoid calling up practitioners from districts which have been particularly affected by aerial attack. The C.M.W.C. realise that London's new health problems make a special demand on practitioners and say that in balancing the conflicting demands of the civilian service and of the military authorities the insurance committee's point of view will be borne in mind. But it has been suggested that, in view of the number of persons being evacuated from London, it should not be difficult to release insurance practitioners for military service, and that since they have lost many private patients they could doubtless assume responsibility for additional numbers of insured patients. Some evacuees, however, return to their home districts within a short time. The panel lists of doctors in the evacuation areas are therefore misleading, because some of their patients who have been officially transferred to provincial doctors have returned to town; while others, living in reception areas, have not troubled to remove their names from their town doctor's list. Thus the names on the lists of doctors in evacuation areas are in excess of the number of patients likely to call them in. There is little danger, therefore, that these doctors will be overworked if they are permitted to take on patients in excess of the normal maximum.

Another difficulty arises out of the release of assistants, particularly where the practice is capable of being administered under the protection of practices scheme. If a principal has been allowed to accept, say, 1000 extra patients by virtue of his employing a permanent assistant, he cannot obtain relief under the scheme if the assistant is called up. If the principal himself is called up the practice can come under the scheme and the assistant can become an acting practitioner and accept such of the principal's patients as apply to him for treatment. It is becoming increasingly difficult to obtain assistants, particularly in areas susceptible to aerial attack, and the London committee feel that they will shortly have to ask for a further relaxation of the limit placed upon the number of insured patients for whom a practitioner may assume responsibility. They think, too, that where an assistant is called up and the principal is unable to obtain the services of another assistant arrangements might be made for other local practitioners to agree to give help so that the principal can retain his full list of patients. This arrangement would have to be administered with caution so that it did not offer an excuse for principals to dispense with the services of their assistants while expecting to retain a list in excess of the permitted maximum. Meanwhile the London committee have applied in three or four cases for special maxima to be allowed to practitioners in the affected areas.

PAGET TELLS HOW HE DISCOVERED TRICHINELLA

IN Stephen Paget's memoir of his father is an account in Sir James Paget's own words of his discovery in 1835 of the *Trichina spiralis* during his first year in the dissecting room at Bart's. My share, he writes, was the detection of the "worm" in its capsule; and I may justly ascribe it to the habit of looking-out, and observing, and wishing to find new things, which I had acquired in my previous studies of botany. All the men in the dissecting-rooms, teachers included, "saw" the little specks in the muscles; but I believe that I alone "looked-at" them and "observed" them: no-one trained in natural history could have failed to do so. The discovery, he goes on, had a memorable consequence,

in procuring me an introduction to Robert Brown. I wanted to examine the entozoon with a microscope, and there was none in the hospital. I thought I might get help from Mr. Children, who was then chief of the Natural History Department of the British Museum, and to whom Mr. Dawson Turner had given me a letter of introduction. He, however, had no microscope; but suggested that "Robert Brown might help me." So we went at once to the little room in the Museum in which the great botanist was at work among books and specimens; and I remember Mr. Children's first question, "Brown, do you know anything about parasitic worms?" and the answer, "No: thank God." But he let me look at my specimens with his little single microscope—the same, I think, that he had done his own grand work with; and I made the sketches of them with which to illustrate the paper read at the Abernethian Society. This, Paget concludes, was certainly the first account given of the new entozoon: but Owen, to whom specimens were taken when I had seen that there was a "worm," read a paper on it at the Zoological Society, and gave it its name. It mattered little: the repute of the discovery would have been of no great use to me: and I should have gained less happiness by disputing it and obtaining it than I have enjoyed in the personal friendship with Owen ever since.

A STANDARD WHOLEMEAL LOAF

THE reinforced flour, with added vitamin B_1 and calcium, is not likely to be on sale for several months, and in the meantime the Ministry of Food are introducing a standard "wholemeal" flour of 85% extraction. It is hoped that this flour will be available almost immediately. The price of the new loaf will be kept the same as that of the present white loaf (8*d*. a quartern) by a Government subsidy, and though its adoption will not be compulsory it will no doubt largely take the place of the white loaf. An extraction of 85% of the wheat berry is about the maximum practicable—only certain gritty parts of the bran will have been removed—and the rise from the present 73% extraction of white flour will have repercussions on the alimentary system of at least a few consumers. In the vast constipated majority the change should be for the better, and the relaxed few will still be able to get their white bread.

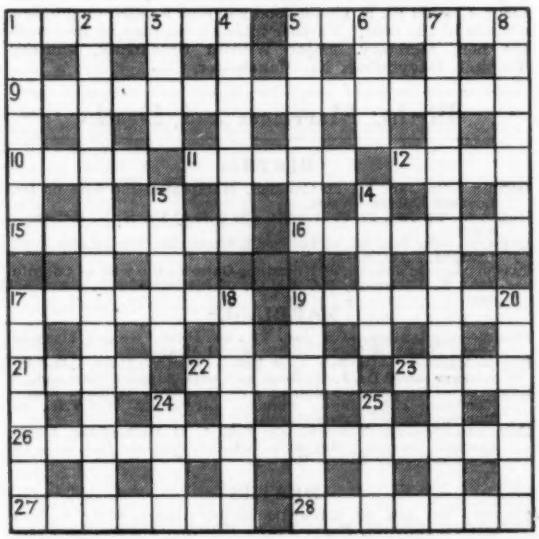
MEDICAL PRACTICE IN RUSSIA

PROBABLY only those unaware of present trends of thought would have been surprised to find the rooms of the Medical Society of London filled to overflowing during a severe daylight air-raid by people eager to hear of the modern developments of medicine in the U.S.S.R. The meeting was organised by the Society for Cultural Relations with the U.S.S.R. and was presided over by Mr. Somerville Hastings. The discussion was opened by Prof. Wood Jones who had had recent experience of refuge centres. His suggestion that reform of medical practice must be an inevitable sequel to those changes in the structure of society that are destined to come about gained rather than lost in cogency by the recent havoc that every member of the audience must have witnessed on his way to the meeting. Dr. Lipetz, who had first-hand experience of medical practice in the U.S.S.R., said that the general practitioner there is in no way better equipped to deal with sick humanity than his counterpart in England, but that the conditions under which he works—the absence of hurry, the constant presence of colleagues in the clinics, and the general atmosphere prevailing in them—make him more efficient in preserving national health. Dr. Joan McMichael dealt with public health and the prophylactic approach in the U.S.S.R.; to many, her facts and statistics were new and surprising. Antenatal care, infant welfare, the rehabilitation of the sick, the whole machinery for ensuring the prevention of disease, made a utopian but documented story. She reverted to a remark of Prof. Wood Jones that man was a captive animal for whom captivity had added to, rather than subtracted from, a constant load of fears and anxieties; and she pictured a state of life, well on its way to attainment in Russia, in which the constant anxiety of sickness and all that it means to the wage earner is largely eliminated. Many must have carried from the meeting a wish that medicine here could be practised among a people safeguarded from cradle to grave by organised preventive medicine.

Droitwich medical committee have asked us to state that reports that it is not possible to get treatment at the spa are incorrect. But accommodation is limited and should be engaged well in advance. The St. Andrew's brine baths are open and so are the rheumatism hospitals and hostel. Information can be had from the local spa association.

The Index and title-page to Vol. II, 1940, which was completed with the issue of Dec. 28, will be ready shortly. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

LANCET CROSSWORD



ACROSS

1. The greater part of a collar-bone (7).
5. Not the sort of pipe that gives you cancer of the tongue (7).
9. Not puce in tussis (15).
10. Blood and bones for him, preferably English (4).
11. Mal-united fractures may have to be this (5).
12. You get it in Hyde Park or in the neck (4).
15. Schick, of course! (Two words, 3, 4).
16. Not one of Molotoff's bread-baskets (7).
17. Not to be thrown at green-houses (7).
19. The orthopædist lets off and does his stuff (7).
21. Impulse to action (4).
22. The end of a stroke (5).
23. Fish paddles backwards (4).
26. Poison for the host (Two words, 9, 6).
27. Pupils in a panic (7).
28. Sir Lucius had reactions like this (7).

DOWN

1. I'd follow the company led by the shouting French (7).
2. The proper study of mankind? (15).
3. He himself (as the Latin has it) mixed these pies (4).
4. "This brilliant and versatile genius, Antoine —— Lavoisier" (7).
5. Fusses up like so many spaniels (7).
6. Gee! it gives you an ache in 16 (4).
7. Observed beside the bed (Two words, 8, 7).
8. Deep to (7).
13. Ocean liquor? Or you can have it dried (5).
14. Tract or tractor (5).
18. Blowing up for trouble (Two words, 3, 4).
19. Noted for his flask (7).
20. Weir-Mitchell treatment is this reversed (7).
24. Gynæcological contrivance not necessarily for the wilderness (4).
25. Some call it Escherichia now, but for most of us it's just the same old *B* —— (4).

LAST WEEK'S SOLUTION

G	R	A	N	U	L	E	S		I	N	G	E	S	T
O		D		L		V			E		D		A	
I	N	D	U	C	T	O	R		S	P	R	E	A	D
T		I		E		K		A		H		N		P
R	E	C	O	R	D	E	R	S		R	E	T	R	O
E	T						T		I		A		L	
			P	O	T	A	S	H		T	I	T	R	E
N		P		B		L		M		I		E		S
E	R	U	P	T		B	R	A	S	S	Y			
C		N		U		I					A		A	
R	E	C	U	R		N	E	M	A	T	O	D	E	S
O		T		A		O		O		A		D		C
T	R	U	E	T	A		F	R	A	C	T	U	R	E
I		A		O				O		H		C		N
C	E	L	E	R	Y		I	N	V	E	S	T	E	D